Unicorn

A Planned Model of Socialism

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To the memory of Fariborz Raisdana

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Introduction

In recent years, the economic crisis following the outbreak of the coronavirus has rekindled serious critiques of the political economy of capitalism. The response of major global capitalist players to this crisis, including programs like the "Great Reset" proposed by lobbyists at the World Economic Forum held in Davos since 2020, has itself led to protests, sometimes manifesting as conspiracy theories. Amid the responses from the most conservative politicians and owners of multinational corporations in their speeches at this forum, addressing the economic crisis with misleading and populist buzzwords such as environmental reforms, sustainable development, green and just growth, and global solidarity, nothing more than the usual rhetoric is evident. In the concept of the "Fourth Industrial Revolution," one of the recent topics of this forum, there is still no effective measure for the intensive care units of hospitals, even in developed countries, to ensure these institutions that are increasingly joining the private sector have enough beds for patients. Thus, natural disasters are still set to claim the lives of the most precarious workers, not the ideologues whose records of tax evasion have never led to their isolation or exclusion from major lobbying circles.

While many believe that understanding economics and its theories is very difficult, these theories and the measures implemented based on them are mostly discussed in university halls and among major political and economic role players. Due to the hegemony of policies theorized in the West, the theories about economic crises generally bear the weight of Western and liberal ideologies. For example, many politicians claim that the current global economic crisis, causing dissatisfaction among various social strata, has arisen due to the Ukraine war and the rising cost of energy carriers. Meanwhile, some lesser-read and seen leftist thinkers argue that today's inflationary crisis is due to "the devaluation of money caused by increased competition among

buyers following non-productive credit" and that its connection to the Ukraine war is merely secondary. According to this analysis, capitalists must first appear as buyers to be able to start the production, turning money into capital by purchasing the means of production, labor, and raw materials. They obtain credit from banks for this purpose. The credit issued by banks has no real physical backing but is based solely on the premise that if the indebted individuals can repay their debts, the credit gains real meaning and becomes a product of social labor. If the debtor cannot repay the debt, meaning the product produced or the work done could not be sold in the market, the depreciation of the means of production and the labor used to produce it leads to increased depreciation and a loss on part of the society. As explained, banks issue credit only if they know it will become a consumable product with utility value in the future. The backing of these credits is also the national treasury. The central bank allocates credit to banks based on the balance of debt repayment rates among different banks and the repayment rate of the central bank itself. When a capitalist cannot sell their product, if they have a monopoly on that specific product, they raise its price. This price increase is not aligned with the amount of labor spent on it or the cost of raw materials and production tools, and the credit used to fund them can only convert into real value if the product sells at this higher price. In other words, monopoly capital tries to increase its profit not by increasing productive labor but by raising prices. Conversely, the buyer, due to having credit, can afford this higher cost. The buyer needs more credit to pay the higher cost, which must be obtained from the bank, and this credit, as mentioned, only turns into real money if it can be productive. Given this

US Dollar Index between 2020 and 2024 - from tradingeconomics.com

explanation, inflation occurs when this credit system is disrupted due to its inability to produce value.[1]

As indicated in the chart, the onset of the inflationary trend for the dollar (which is used to purchase energy in many regions of the world, including Europe) predates the Ukraine war, during a time when both buyers and producers needed more credit for production. This credit was expended, but due to the challenges that arose following the virus outbreak (alongside other factors), it failed to be sold or converted into productive capital.

In another instance, the alarming news that shook Western investors in March 2023 was the bankruptcy declarations of Silicon Valley Bank in the United States and Credit Suisse in Switzerland, occurring within a short period of each other. These banks, operating for years with initial capital amounting to about 20 to 30 percent of the total credits allocated to individuals and entities, continued their high-risk activities but were unable to sustain themselves post-pandemic, even with rising interest rates. Sahra Wagenknecht -a member of the opposition Left Party in the German parliament who criticizes the coalition government on her Youtube channel- accuses Western governments of causing such a massive debacle by failing to oversee the amount of credit issued by banks and major financial institutions, thereby exacerbating or at least deepening the current financial crisis, making consumers and households with mounting debts bear the brunt.[2] The question remains, however, whether such oversight on major financial players would have allowed the West to achieve even the current (negative) growth. Is such oversight conceivable within the corrupt

structures of today's capitalist states? Ultimately, can such policies alleviate the inflationary burden on society?

Furthermore, inflation is considered a crisis only when it exceeds a minimal level. A slight inflation rate (around two percent) is actually favorable for capitalists as it encourages consumers to make their purchases today rather than tomorrow. Thus, inflation inherently benefits capitalism that engages in credit acquisition and only becomes a problem when it ensnares the key stakeholders and power brokers.

This is just one explanation for the issue of inflation, which, due to the globalization of capitalist processes, affects consumers in the market system worldwide. However, activism aimed at changing the economic order today is plagued by a theoretical vacuum. Currently, the predominant trends in economic and political studies are reformist, aiming to reduce the class divide — not eliminate it — and make market relations fairer. This trend includes a significant portion of leftist thinkers. One of the primary challenges in critiquing the unrestrained global capitalist system seems to be the weakness in theorizing comprehensive and complete alternatives capable of transforming economic and human relations in such a way that justice is central within them and economic classes and exploitation are abolished. Socialist alternatives claiming to eliminate exploitation and end human commodification are still criticized by those whose lives are entirely under capitalist dominance with one simple sentence: "Socialism is not feasible because the Soviet experiment failed!"

This statement indeed highlights a harsh reality: the dominance of free-market media over the thoughts and beliefs of the working class is so profound that it renders the only alternative potentially liberating for them as impossible. No one compares this statement to the invention of the airplane, a dream that, like almost all dreams, initially failed several times. No one sees socialism as a historical reality that, although imperfect, has precedents. Furthermore, the ideas defending the free market actually advocate something so idealistic that, despite the support of a large segment of economists and politicians, has never materialized in any country and all attempts toward it have faced fundamental failures. Yet, there are not many economists today who claim the formation of a

free market is impossible. This fact underscores the ideological dominance over both popular and academic discourses regarding political economy.

Economics is a complex science. Just as the behavior of complex systems cannot generally be represented by a simple formula, a scientific understanding of economic relations must encompass this intricate context. In economics, the market possesses this characteristic. The market serves as a platform for complex human relations that appraise everything and reduce human activities to a number. This number encompasses complex arrangements and functions that market participants are not necessarily aware of, and they can only interact with goods, labor, and each other through the representation of these functions—price. Although the market does not represent all human activities—and arguably should not—it inherently has the potential to depict all human relations through this price reduction approach. The market predates capitalism and even money itself, which has solidified its role in human relations.

In the market, a buyer can decide to purchase the desired goods or services based on the selling price or choose to forgo it, and they are to some extent free in making this decision. We say "to some extent" because, ultimately, the money the buyer has in their pocket limits their freedom. The market does not offer a solution to this problem. Someone whose money has been systematically or unsystematically stolen, or who has been forced to spend it on their sick child, can, according to market laws, remain hungry for a few days. Additionally, a seller, being free to set any price for their product, can sell their products at higher prices for various reasons, such as having privileges in using natural resources or social status (a bourgeois democracy, which is a specific form of democracy favoring capitalists, allows them to do this). By accumulating money or hoarding in sales, they prepare more opportunities to utilize society's limited resources for themselves and their descendants.

The market operates based on the society's mode of production but has a reciprocal relationship with it and influences it. Thus, while the capitalist market is the common mode of exchange in today's world, the socialist market is also a phenomenon that operates based on the socialist mode of production. It is not

necessarily the market that leads to inequality, but the commodity production mode and capitalist redistribution that are the main causes of increasing poverty and class division in our world. The global market reflects the global imperialist mode of production. While our everyday world is shaped by the commodity production mode, there are many differences and diversities in our understanding of the socialist mode of production.

If we consider capitalism as a broad continuum, socialism is an idea with as many meanings as there are theorists. In USA, many call Bernie Sanders a socialist because one of his campaign programs was to provide social security insurance to all Americans. This, of course, is significantly different from a socialism where the means of production are reclaimed from the capitalist class and belong to everyone; yet, both of these two entirely different phenomena are called socialism. Among most thinkers, socialism has a broad and comprehensive meaning: a mode of production that emerges from capitalism, where the ownership of the means of production is no longer in the hands of any minority but belongs to the general public. Our minimal understanding of socialism is also this. According to the definition we provide in this book, a society —such as Germany—where revisionist leftists seated in parliamentary seats have slightly pulled the reins on certain aspects of capitalism, or a society where free transportation is the only free service provided to the community, or a society with state capitalism, are not socialist.

In recent years, many programs and projects have attempted to make living conditions fairer for the general public and reduce class contradictions without consciously striving to eliminate the philosophical contradictions and dilemmas of capitalism. Populist programs and ideas such as Universal Basic Income are among these. Many critics believe that such programs not only fail to take even the smallest step in reducing economic inequalities but also serve as a safety valve to prevent the formation of widespread and radical social protests against the existing order.

The socialism we are discussing—as we will elaborate more throughout this book—is only possible with a fundamental change in the economic order of society from one based on the exclusive ownership of the means of production to public ownership of them.

Despite the multiplicity of definitions of socialism available, what distinguishes socialism from capitalism—regardless of the social and cultural differences between the two societies that operate with these economies and regardless of the clamor of political activists for and against socialism—is that in capitalism, if surplus value is produced, it becomes the exclusive property of the capitalist and their family, while in socialism, this surplus is distributed among all members of society.

In the discussions surrounding the explanation and critique of the socialist mode of production, one of the central concepts is value. The key question here is how the value of goods and services should be calculated in the aftermath of the collapse of capitalist economic relations and in the absence of a market based on capitalism and commodity production mode. This is a question we address in detail throughout the book. However, the prevailing opinion is that since socialism is a system emerging from within capitalism, the calculation of the value of goods and services continues, but its arrangement differs fundamentally from its commodity form in capitalism. Production units participate in the economic sphere based on a model of production, reproduction, and distribution of value, and overall, it can be said that in socialism, the determination of value has a computational and numerical method. Additionally, socialism, in the evolution of its approaches, ultimately leads to communism, where the productive forces in society have reached a comprehensive understanding of the needs of consumers and other producers. In communism, value is likely no longer calculated in the traditional numerical sense, and everyone consumes according to their needs and works according to their desires and abilities. It is evident that the shape of such a society is currently unimaginable to us, as its dimensions are determined by the specific form of socialism. In this book, we do not address the subject of communism but rather examine the intermediate phase or socialism. Therefore, since we neither discuss the conditions of a socialist revolution nor the final phase extensively, the order we envision is necessarily hypothetical and theoretical, and its theorization is shaped using the current understanding of political economy and past implemented models. In our opinion, having a general understanding of the socialist political economy is very

important and inevitable for the global leftist movement. The absence of such a theory makes many political ideas about socialism and even the socialist revolution meaningless, unsupported, and merely negative and reactionary.

This book is an attempt to introduce one of the most well-known models of a socialist economy based on planning, which is largely unfamiliar to Persian-speaking audience. This model was first published in 1993 in a book titled "Towards a New Socialism" in England, and its translation has been printed in other countries over the years and decades. The designers of this model succeeded in bringing the labor theory of value, which had been forgotten for various reasons, back to the forefront by publishing a book that forms the basis and central idea of this book.

The central idea of this project transforms fundamental critiques of the capitalist economic system -which is currently the dominant economic system everywhere in the world[3] - into a program in which the economy operates fundamentally differently, and the social relations between producers and consumers are based on the value created from labor. Accordingly, it is no longer the invisible hand of the market that meets human needs, but with the elimination of the market intermediary, which necessarily operates chaotically, the needs of industry and consumers are directly identified by producers using a mechanized system and addressed consciously.[4] This type of socialist modeling is known as cyber socialism, with the Cybersyn project, implemented in the final two years of Allende's era in Chile, being one of its earliest models. The computational method used for this model is one of the most successful tools in economics, which the former Soviet government rejected for ideological reasons and never fully utilized; although the Soviets used a similar and highly inefficient method for nationalized sectors of the economy, including heavy industries.

The input-output tables discussed in the chapters of this book are the most precise method for calculating the interactions between different economic units and sectors and are currently used by major statistical organizations and economic regulators. By using an extended version of these tables—as we will explain—it is possible to accurately calculate the relationship of all goods in society with one another, as well as the amount of labor value

encapsulated in goods and services. Changes in supply and demand, production costs, and the productivity of labor and production can be recorded exactly as they are and, thanks to advanced computer systems available today, can be calculated faster than ever before in history.

However, parts of the model presented by Cockshott and Cottrell (the authors of the aforementioned book), which are also referenced in this book, have been criticized by groups working on similar models. For example, a small group based in Berlin working on a similar model[5] recently criticized some aspects of this book. [6] They basically pointed out two issues: rent and price changes in micro-planning. They argue that setting rent for land and changing prices to balance production distances the valuation system from labor-based valuation, creates contradictions in the computational method, and ultimately leads to new inequalities. Setting rent and adjusting prices from above for any reason means that the value of goods no longer reflects their labor content and is instead random, as in capitalism. While in the introduced model, price changes and land rent do not contradict the calculations used in macro-planning, implementing these changes means that an hour of work will no longer have the same value everywhere over time, and deviating from labor-based value calculation undermines the macro-planning and other planning levels' consistency with the main theory.

Another criticism of this model is the political system based on the economic model. The authors of "Towards a New Socialism" believe that workers are often unable to manage the economy because their interests do not always align with the interests of society. This is a controversial issue, but we agree with the critics. We believe that if workers (the producers of all value) cannot manage a socialist society, then no one else can either.

Therefore, we have altered the content of parts of the original book, and our addition of the idea of Unicorn, a mechanized management system accessible to all members of society aligns well with the main line of the book, without contradicting the proposed computational method. This system has many advantages, including being used simultaneously by production and service units as a system for ordering intermediate goods. Additionally, the political superstructure introduced in this book differs from the structure

envisioned by Cockshott and Cottrell, returning power to the workers and their unions.

Finally, we must briefly mention a few points: First, throughout this book, we use the term "worker." This term is politically contested. Here, we clarify that a worker in this book refers to a person who does not own the means of production in a capitalist society and only uses the means of production owned by capitalists to produce goods or provide services. Therefore, according to this definition, an employee or a CEO without a share in the company, working for a wage, is also considered a worker. In socialism, a worker is simply someone who works.

We have clearly tried to avoid translating the ideas of Cockshott and Cottrell into Persian in a way that makes the text overly complex for Persian-speaking readers, aiming to remove translation and interpretation barriers as much as possible. Moreover, considering that concepts like credit, market, bank, and similar terms undergo fundamental changes in socialism, it might have been better to use new names for these concepts, as is sometimes customary. However, to avoid complicating the text further, we have used terms familiar to readers from the real world based on capitalism. We believe we have frequently explained how each of these concepts changes in socialism throughout the chapters of the book.

This book makes numerous references to Marx and Engels. Therefore, we must clarify that Marx is neither a prophet nor infallible to us. His views changed at different stages of his life, and no one knows what he would say or do if he were alive today. Our reference to the work of these two thinkers is because our critique of capitalist political economy, from which we begin our work, owes much to their arduous efforts. If our understanding of the economy is what it is today, it is due to their numerous works and meticulous critique. However, socialism was neither invented by Marx and Engels nor limited to European history (it is said that Saint-Simon, an 18th-century French libertarian officer, was the first to use the term socialism, but similar ideas to European socialism can also be found in what is now known as Iran). Moreover, they (specifically Marx) have previously hinted at the system we discuss here, but they were by no means the first to

come up with such an idea.

Finally, we ask all enthusiasts to help us write the code for the Unicorn program so that we can test it in real-world work environments. To this end, we have created an open-source repository on GitHub, where enthusiasts can use the code and make their contributions or suggest coding changes directly to the repository. The repository is available at the following address:

https://github.com/kgk45tGg45u/unicorn

The Problem

The economic and political system prevalent in the world today is based on capitalism. Despite all its complexities, capitalism is built on a simple principle: profit accumulation. The global capitalist order is structured in such a way that maximum profit production for capitalists and investors is possible. In a society based on the (capitalist) mode of commodity production, this logic underpins all economic relationships within the society. If a business does not generate profit based on local or global capitalist mechanisms and is solely established on the fair production of human necessities, it will sooner or later be eliminated from the economic and competitive cycle.

The economic system that emerged from the ashes of the former feudal system dominating Europe is also based on human exploitation. Many philosophers, from Aristotle to Hegel, have spoken about the phenomenological nature of exploitation and servitude. By controlling all economic and social arenas, capitalism effectively takes away the choice from its counterpart, the workers. Workers and the masses can only be truly free if they can determine their economic activities and influence the processes involved. Capitalism denies this possibility and introduces an opaque contract to the worker, seizing part of his daily labor for personal or institutional use. The commodity production mode accomplishes this by seizing the means of production (machinery, land, and labor). The capitalist takes control of the means of production, and the worker, due to the lack of ownership of the means of production, has nothing to offer to society except their labor. This places the worker in an inferior position in terms of their ability to participate in the economy and society at large. Therefore, society, based on the dominant capitalist logic, is divided into two main economic classes: the class that owns the means of production and thus exploits the other class, which does not own the means of production.[7] It is necessary to mention here that being a worker is

an objective and predetermined identity given to individuals by the division of social labor and the mechanical laws of the commodity production mode.

In certain historical periods, increased profit was achieved through excessive exploitation of labor, where most workers had to spend exhausting amounts of their daily hours working to avoid extreme hunger, while at the same time, capital owners and employers could accumulate as much surplus value as possible. For centuries now, workers and peasants have had to spend part of their daily working hours providing for themselves and their families and another part working for free for those who employ them. In pre-capitalist societies, this daily division of labor was very transparent and objective. The peasant worked part of the day on communal land to provide for himself and his family, and another part of the day on the lord's land. Thus, the division of labor during the feudal era was entirely objective. While the peasant could take part of the yields from working on communal land for his and his family's consumption, the yields from working on the lord's land exclusively belonged to the lord, and the peasant had no right to interfere with it. Of course, working on the lord's land yielded very little for the peasant. In the 19th century, during the rise of capitalism towards prosperity, workers were forced into contracts in which exploitation remained institutionalized and central.

Today, workers still spend part of their working day producing their own necessities and another part producing surplus value that is exclusively consumed by the capitalist. However, as Marx explained in Capital, the wage system has never been transparent in this regard and has always conveyed to the worker that the worker has freely and transparently contracted their labor to the employer and that each hour worked is fairly calculated at the agreed rate. Nevertheless, in the first volume of Capital, Marx details the conditions where female and child workers in 18th and 19th century Europe, without signing any contracts, were forced to work in ways that endangered their lives and health to keep capitalists' businesses running. They sometimes had to consume their daily sustenance while working, sleep next to their spinning machines, and suffer extreme sleep deprivation and various diseases caused by excessive exploitation, leading to irreparable accidents in the

workplace.

The working conditions in the 21st century are somewhat different from those in the 19th century, but the core essence of the narrative has not changed. Today, workers, even in countries with welfare states, take to the streets due to not receiving their salaries for several months, and poverty and hunger envelop billions of people under their thin cover. Meanwhile, capital owners contemplate buying unnamed islands for themselves and naming them. The rampant privatization of production units strips workers of the minimal job security and basic welfare they had achieved through centuries of struggle against capitalist exploitation, leading to severe poverty or deeper inequality gaps. This is not only a painful narrative of the lives of the vast majority of producers of value in society, but the existing class gap even conveys a sense of poverty to those who can meet their most basic needs.

As mentioned, in capitalism, the principle is to maximize the profit that goes into the capitalist's pocket. This is sometimes achieved by exploiting workers more and extracting more working hours from them, sometimes by finding cheaper raw materials, and sometimes by upgrading the means of production. However, the dimensions of exploitation and resulting inequality in capitalism go far beyond the excessive exploitation of the labor force. Unemployment is a systematic factor in maintaining and perpetuating the exploitation of employed individuals. The presence of unemployment in society ensures that the labor market remains buoyant: there will be several applicants for each job, and the low wage rate for those who have no choice but to find work as quickly as possible, and for those who may easily lose their job (due to protesting low wages) to the unemployed, will not be questioned. If labor unions know that the employer can easily hire strikebreakers from among the unemployed, they will hesitate to protest and strike for higher wages: large corporations can, in the event of workers protesting low wages, sometimes fire the entire workforce and hire replacement workers at lower wages. This is the method many capitalist companies use to maintain their margin of power over workers, and it is implemented on a daily basis in large international companies like Amazon and Microsoft. In capitalism, unemployment is not a problem; it is a purposeful system.

Capitalism is also not only unable to control the economic crises that grip it, but is also incapable of understanding the patterns of crises and predicting them. The global financial crises of the 1930s and 2000s were resolved at the expense of the workers in the most severe manner possible, and the inflation crisis that today grips not only Europe but the entire world means hunger and homelessness for the people responsible for producing all the value in society. It is needless to repeat that during this period, the capital of multinational companies has been increasing and continues to do so.

In contrast, the principle in a socialist system is based on the elimination or equitable redistribution of surplus value and the common use of the products of each other's labor. The difference between the formula on which the capitalist system and the socialist system operate seems small: surplus value, instead of being deposited into the capitalist's pocket, is either eliminated or allocated to improving the general living standards. However, this change in the principle of surplus value transforms the foundation of society and brings about a fundamental change in all economic and social institutions. Marx, in his manuscripts from the 1840s, addresses a society that is no longer alienated. This Marxian utopia is a place where there is "no more greed, competition, profit-making, cheating, fraud and exploitation; rather all relationships would be in harmony."[8]

Despite all this, many view the idea of socialism with skepticism. Today, the idea of capitalism has permeated all institutions of society so thoroughly that any alternative seems impossible and utopian. The attempts, mainly in the 20th century, to establish a socialist order all ended in failure, and imperialist capitalism, with its simple and hostile logic, once again took the economic markets under its military boot. Since the collapse of the Eastern Bloc, which was not long ago, most socialist forces and workers have lost all hope of fundamental change and now strive to conceal their hopes and maintain their facade of resilience.

Is socialism possible?

The socialization of the means of production and the communal use of each other's labor products have occupied a large part of the history of human societies. It was only in the last few hundred years that colonialism, technological advancement, and growth in population paved the way for the establishment of specific forms of ownership over land and means of production. The discovery of America and the consequent over-exploitation of workers in Africa and South America provided almost free resources of raw materials for European countries. Additionally, World War I and II led to the flourishing of industry in parts of the world that were directly or indirectly involved in the war. Capitalism, using unlimited resources of raw materials and labor, and through a process known as primitive accumulation, utilized the labor force of peasants who were forcibly migrated to cities in the new factories, thereby fundamentally changing the lifestyle of various social classes. “Thus it came to pass that the former sort accumulated wealth, and the latter sort had at last nothing to sell except their own skins. And from this original sin dates the poverty of the great majority that, despite all its labour, has up to now nothing to sell but itself, and the wealth of the few that increases constantly although they have long ceased to work.”[9]

The idea of socialism, in the form of workers' struggle movements against the oligarchy of capital, emerged at the very inception of capitalist institutions. Anarchist movements and utopian socialists were engaged in class struggle long before Marx wrote his objective critique of capital and published his famous manifesto. Eight-hour workdays, unemployment insurance, and other job benefits are all the result of centuries of struggle against capitalism. Finally, at the beginning of the 20th century, the communists in Russia managed to seize power through a years-long process and establish a new system in which unemployment was largely eradicated, and the country achieved remarkable industrial progress in a short period. However, this new system faced new challenges, which we will gradually address throughout the book. Generally, it can be said that economic mismanagement and state despotism were two main factors in the collapse of the Soviet bloc and the return of capitalism to the Eastern bloc countries. There is still much debate about whether the state and economic system in

the Soviet Union were socialist or merely a form of inefficient state capitalism, which we will try to explore some aspects of in the chapters of this book.

Within this framework, the question that faces us is: Is socialism possible? And if so, how can it become the law of motion of the social sphere? Marx, with his unique diligence, managed to bring the critique of political economy of capitalism into the realm of science by collecting and criticizing the efforts of previous thinkers on economic theory and adding unique content to it. This allowed for a precise examination of its dimensions, granting scientific legitimacy to the critique of capitalism. He showed us how to lay the foundations of a science that, by examining the macro and microeconomic levers in society, focuses on humanity's liberation from exploitation. However, Marx and Engels were merely links in a chain. Workers' struggles in Europe were unique and, in many cases, even opposed to the current that Marx and Engels introduced. In many of their writings and speeches in the International, they criticized the labor movement of those days, including the Social Democracy movement in Germany led by Ferdinand Lassalle and others. These critiques were often ineffective: German socialism took a path that Marx and Engels strongly criticized. 1930s Spain had learned much from Marx, but a large portion of its revolutionaries were anarchists.

The strikes, mass protests, and revolutions from the 1840s to the 1920s against capitalism and the unfavorable consequences of its mode of production in various countries around the world indicate the growing awareness of workers about their subjugation and their efforts to create an egalitarian alternative. However, despite the large political movement represented by the working class, there was no precise understanding of the socialist utopia. In his vast array of works, Marx detailed the critique of the 19th-century capitalist system and the European social-democratic currents, but he seldom theorized about the nature of the socialist economic system.[10] Nevertheless, we have a particular understanding of Marx's concept of socialism. In the first volume of Capital, he envisions a form of this socialist ideal:

“Let us finally imagine, for a change, an association of free men,

working with the means of production held in common, and expending their many differ- ent forms of labour-power in full self-awareness as one single social labour force… The total product of our imagined association is a social product. One part of this product serves as fresh means of production and remains social. But another part is consumed by the members of the association as means of subsistence. This part must therefore be divided amongst them. The way this division is made will vary with the particular kind of social organization of production and the corresponding level of social development attained by the producers."[11]

In Capital, Marx extensively discusses the laws governing the commodity production mode. He criticizes economists before him, such as Adam Smith and Ricardo, showing that capitalism is not a natural progression of the economy but merely a specific type of it. He also demonstrates, using formulas still taught in universities worldwide, exactly how workers provide their labor power entirely to the capitalist and how the capitalist extracts surplus value from their labor.

To better understand how the transition from capitalism is possible and what follows, we have no choice but to study the works of socialists and anarchists who wielded political power. In 1917, Vladimir Lenin and his party managed to steer Tsarist Russia towards a different order. This was the first successful and significant attempt by communists to gain political power. Lenin's understanding of Marx and Engels' manifesto was that in the transition from capitalism to socialism, the state is "the proletariat organized as the ruling class."[12]

In another instance, while Marx saw economic conditions as the driver of a social revolution, the Russian anarchist Bakunin believed that it was the power of the will that brought about revolutions. In his critique of this belief, Marx wrote: "Under collective ownership the so-called people's will disappears to make way for the real will of the cooperative."[13] Although socialism and anarchism differ in their methods of achieving communism and a classless world, they ultimately want the same thing: the removal of capitalists from economic production processes, the communalization of the means of production, and the abolition of private ownership of the means of production. Bakunin, in the Anarchist Manifesto published in

1865, writes that anarchists must initially be socialists. All these thinkers agreed that monopolistic individualism is fundamentally inhumane, but this does not automatically abolish individualistic relations. Achieving communal ownership of the means of production requires a will and organized struggle.

But how is this communal ownership and shared labor to be achieved, and what dimensions can such an organization have? Probably all thinkers in the field of political economy agree that reaching socialism involves two essential stages. The first stage includes the socialist revolution and the attainment of a society where the means of production are removed from the capitalists' monopoly, and class exploitation ends. The next stage, which occurs after the first, involves advancing to a construction where society, based on the new mode of production, redistributes the produced value among individuals in society. In this book, we will not focus on the first stage, which mainly involves the political and economic struggle of workers and other subjugated populations against the commodity production order; a lot of literature on this subject is published daily. Marx believed that achieving a socialist mode of production could result from a social revolution, but he also believed that revolutionary conditions are subject to contingency and choice. He did not rule out the possibility of revolutionaries and workers using conditions that facilitate a socialist revolution to achieve this goal. In the Eighteenth Brumaire of Louis Bonaparte, he writes: “Men make their own history, but they do not make it just as they please; they do not make it under circumstances chosen by themselves, but under circumstances directly found, given and transmitted from the past.”[14] Therefore, from Marx's perspective, revolution is not an event separate from history but a point in the continuation of the dialectical conditions of human life. In this discussion, we will try to focus on the economic aspect of socialism. This aspect is not only the goal of socialists and communists, but, as we mentioned, it is also the aim of anarchists. Moreover, it is an aspect that not only Marx, Engels, and others produced the least literature on, but it has also been subject to injustice and misunderstanding by many Marxist and non-Marxist economists.

At the beginning of the twentieth century, alongside the Soviet experience, the debate among economists of various schools

regarding an efficient socialist model that entails the socialization of production, the communality of the means of production, and other socialist values, posed a challenge known as the "socialist calculation debate." In the 1920s, some economists, including Ludwig von Mises and Friedrich Hayek, claimed that while in a capitalist system, production costs, labor wages, and commodity prices are calculable with existing formulas and an efficient and previously experienced value system, in the absence of a monetary form of value and consequently a market, performing calculations that would lead to the formation of a socialist economic alternative is practically impossible. While Mises, from the Austrian school, believed that any rational calculation and allocation of resources in a system based on shared means of production is impossible, Hayek claimed that these calculations might be theoretically possible, but practically, due to the need for resources to be allocated by the planning organization of the socialist government, encompassing a complete list of different quantities for all goods purchasable at different rates, such a task is practically unfeasible because, given the number of products available in the market and the fact that each product is a combination of an unknown number of other products and the production of each of these products requires different resources, such a list would be very lengthy, and efficient calculation of it would not be practical.[15] Therefore, the main question in the socialist calculation debate is how, if the monetary system of value and the market are eliminated from social relations, should the calculation of value and the allocation of labor in different sectors of society be carried out.

Oskar Lange, a professor at the University of Warsaw, was able to demonstrate, based on assumptions from Frederick Taylor, in his famous work entitled "On the Economic Theory of Socialism," that even in a market-based system, the calculation of these values might be possible.[16] He also showed in this work that the socialist economy is superior to capitalism.

Marx himself intended to outline some general principles regarding the socialist mode of production but did not have the opportunity to do so. However, in many of his works, including The Critique of the Gotha Program and Capital, he referred to the generalities of an imaginary-logical socialist society, in which the

value of goods is calculated not based on their final prices but based on the amount of labor expended on them, calculated by the hour. In the model he occasionally referred to in his works, workers receive their share of production based on the hours they work and, by deducting social consumption costs, receive their share from the social inventory of consumer goods. This share is not in the form of money, which in the commodity production mode is itself another commodity, but is referred to by Marx as a "labor certificate." These labor certificates are disposable, disappearing after the buying or selling process, and, unlike money as we know it, do not circulate in society. Marx praised a model introduced by Robert Owen of a society based on cooperation and wrote about an individual living in such a society:

> “He receives a certificate from society that he has furnished such-and-such an amount of labor (after deducting his labor for the common funds); and with this certificate, he draws from the social stock of means of consumption as much as the same amount of labor cost. The same amount of labor which he has given to society in one form, he receives back in another.”[17]

In 1930, another group called the Group of International Communists, whose main circle was in the Netherlands, theorized a calculation based on these "labor certificates" in a book titled "Fundamental Principles of Communist Production and Distribution" and demonstrated with a simple formula that each worker should receive part of their working hours in the form of labor certificates and allocate another part to society so that public and free services in the society can be provided. Another interesting point discussed in the latter book is the group's critique of the economic and political policies of the former Soviet Union. The authors of this book believed that the Bolsheviks could not completely take the means of production out of the hands of the capitalists and therefore had no choice but to implement gradual reforms in the economic structure.

As Lange demonstrated, the complexity of designing an efficient model for a socialist economy is not much different from a capitalist economy, and the calculation might be somewhat simpler due to

the lack of conflicting interests among different corporations and institutions. One challenge in this regard is the absence of practical and objective data that decision-makers can use to plan the production and distribution of value. Without a centralized mechanism for collecting data from factories on their production and consumption (raw materials and labor) and consumer data, it is impossible to calculate the values. Hayek believed that even if calculating values in a socialist economy is possible, the main problem socialism faces is the method of resource allocation based on this data. This is because the knowledge of how to allocate resources is not fully known by anyone, and no individual alone can carry out these calculations.[18] He argued that the most efficient economic system is one that can best utilize all this existing knowledge, and he considered the market pricing system the best way to avoid blind economic behavior. The lack of a method for socialist calculations in the 1920s and several decades that came after convinced many economists that the market mechanism is the only way to calculate the exchange value of anything in society, whether labor, goods, or services, and (if necessary) to plan for them.

However, contrary to the belief of many bourgeois economists and with the advancement of computer technology in recent decades, a precise method for solving the socialist calculation problem is now available, which we will address in the next chapter. These methods and the efficient computational techniques designed to facilitate them emerged in the 1930s, a time when many communists, influenced by Russian planners who for unknown reasons called these methods "bourgeois," and bourgeois academics who had long been seeking to reform the market and make it socialist through Lange's method, had forgotten about them. Besides the ideological approach of the Russians to the input-output method, which plays an important role in economics today, in Stalinist Russia, despite the use of computers by the government planning committee (Gosplan), the input and output calculations of production were very slow and incomplete. When the production figures of each factory were presented to the planners for decision-making, this information was already outdated. Additionally, systemic corruption was inherent in the political and administrative

system, and many production units in Russia manipulated their production data to ultimately obtain more revenue and resources. The inefficiency of the USSR government in controlling a market that could at best be considered semi-socialist forced the authorities to implement strict laws to punish individuals and entities that disobeyed orders. Moreover, planning was carried out by individuals who were sometimes not directly involved in the production process, and the Communist Party repeatedly excluded labor unions from effective decision-making in planning. All these reasons, along with a chain of other factors, led to an economic collapse due to the failure in removing the means of production from the control of capitalists and bureaucrats thoroughly and abolishing wage labor. In our view, the socialization of the means of production, the abolition of money, the market, and the entire capitalist system in various ways are possible. We will discuss the generalities of one method of calculating the exchange value of things in the upcoming chapters.

The Economic Foundation of a Socialist Model

There is very little literature regarding the economic foundation of a society whose relations are based on the socialist mode of production. Although Marx and Engels were able to provide a scientific framework for critiquing capitalism in the nineteenth century, they did not leave behind a comprehensive work detailing the dimensions of a socialist alternative to capitalism. As we mentioned in the previous section, the lack of suitable and efficient theoretical and computational mechanisms for collecting economic data, analyzing it, and presenting a conscious plan for its systematic management led many economic schools to either abandon the idea of socialism entirely or to attempt minor reforms within the capitalist mode of production. Furthermore, there is a collective wisdom among Marxist circles according to which theorizing about socialism while the forces of production have not yet fully realized their economic position and class consciousness has not progressed enough for workers and communist parties to formulate and present their programs in revolutionary conditions is futile. Nevertheless, the noticeable absence of hypothetical models or ideation from workers and economists in this field suggests that the reason for this gap goes beyond political and ideological considerations.

Most proponents of slogans like "power to the people" or "workers' councils" do not know what they are talking about. How can people take power and socialize the production and distribution of value so that everyone benefits from the economy's wealth? What roles can or should workers' councils play in a socialist society? Meanwhile, the Austrian School thinkers, despite the bourgeois narrow-mindedness of most of their members, have significantly contributed to the scientific enrichment of the debate by critiquing existing ideas. Hayek claims, "Most socialists have little idea of what the system they advocate is really to be like, whether it is to be a planned or a competitive system. It is at present one of the

strongest tactics of contemporary socialists to leave this point in the dark."[19]

Marx and Engels believed that socialism would be born out of capitalism, and for this purpose, economic conditions must have reached a level where a transition to socialism is possible. The advancement of the means of production is a necessary but insufficient condition for achieving socialism for Marxists. However, Marx and Engels never indicated to what extent the conditions and means of production should advance before socialism can be considered an achievable and debatable ideal. Marx merely mentions that his idea of the advancement of production relations is reaching a level where people no longer face a shortage of consumer goods, and socialism can provide a plan for managing production with this precondition.

Despite these limitations, economic theory, albeit limited and incomplete, has addressed the possibility and probable dimensions of socialism. There are three main and major trends in modeling a socialist economy: market-based socialist economic models, planned economy, and participatory economy. Market economy models are primarily based on the premise that the market alone can respond to consumers' needs and producers' supply levels. Many economists of this school believe that conscious planning and altering the relatively automatic processes of the market leads to market disruption and supply and demand system issues. Free market ideology holds that there is an equilibrium point between supply and demand that the market can achieve without external interference by adjusting prices and supply. According to this view, the price of a commodity contains all the knowledge the market needs to regulate itself. Lachmann believes that the "market process is the outward manifestation of an unending stream of knowledge"[20] This idea, that the market can regulate itself in a concentrated manner and that its invisible hand has magical ways, is not only axiomatic among mainstream neoliberal economists but has also attracted many socialist advocates of the market economy.

While it appears that the market can relatively efficiently analyze and regulate information, in most existing models of market socialism, the possibility of accumulating money and capital is granted to producers due to the non-elimination of circulating

money. Thus, if the market is left to itself, it will result in nothing but the further enrichment of capitalists and will not solve the problem of eliminating exploitation and returning the possibility of production management to the producers. In many existing models of socialist market economy, theorists attempt to address this issue by redefining socialism.[21] Today, models that can fulfil all socialist demands—such as the abolition of private ownership of the means of production, the elimination of money and commodity production, the eradication of exploitation, and the fair redistribution of value—are exceedingly rare.

In contrast to the majority of the context on market economy, many models of socialist planning argue that the market is unable to properly discern the needs of consumers and also fails to provide an effective and democratic solution to prevent the re-emergence of capitalist formations in economic layers - one of the greatest risks faced by all socialist economies to date.

Furthermore, economists who believe in planning are generally divided into two main categories: the first group believes that in the absence of a market, there is no way to calculate the exchange values in society, and planning can only focus on partial adjustments within the broad spectrum of prices determined by capitalists, forcing them to allocate a larger share of the cake to producers, thereby increasing public welfare. Today, most governments follow this approach. The second group consists of Marxists who believe that computational methods are available to solve the problem, and by creating a quasi-market fundamentally different from the capitalist market and homogeneous with the socialist mode of production, a mechanism can be designed where planning is based on social production, and by doing so, a machine can be built that works with socialist economics. Engels believed that as soon as socialism is achieved, “the social anarchy of production gives place to a social regulation of production upon a definite plan, according to the needs of the community and of each individual.”[22] On the other hand, Mises believed that the only way society can take control of the means of production is “through the setting up of a special body for the purpose”[23] In his view, centralized planning alongside a market can achieve this; however, he does not provide strong reasons why planning can only be

possible within the framework of the conventional market. The main flaw in existing theories about planning is generally that decision-making takes place from the top down; planners do not have a concrete and ground-level understanding of production conditions, and planning is based solely on trial and error, the preferences of the political party carrying it out, and the rationality of its preferences on investment.

Participatory economies aim to decentralize decision-making processes, allowing economic and social institutions to intervene in these processes and create political coherence among existing organizations by allowing everyone to participate in decision-making. This approach also has supporters among both socialist and non-socialist economists. Many of the models proposed by participatory economists are partial and do not provide comprehensive plans for controlling the economy - plans in which the factors of capitalist reproduction remain intact. The programs introduced by Richard Wolf and Michael Albert are as such. They attempt to encourage workers to create parallel institutions to capital, where ownership of the means of production is not private or public, but collective. One belief here is that if we get enough of these democratic production institutions, we can then say a step towards rebalancing forces in the favor of collective labor is taken, and ultimately a fundamental change in the mode of production of goods takes shape. Albert describes ideas “to federate the co-ops, facilitating their interacting and exchanging via social rather than market norms.”[24] Daniel Saros of the school of participatory economists, writes in his new book that a large part of the theoretical debate among socialist economists revolves around defining socialism. In Saros's proposed socialism, individuals register their future needs using the internet so that producers can plan short-term and long-term plans based on this information.[25] If we believe that one of the most important features of socialism is the absence of class-based exploitation, many market-based, welfare-state, planning, and participatory economics models, in which the means of production remain in the hands of capitalists (or a group of them referred to as "shareholders"), would be excluded from the discussion.

In 1993, two university professors named Paul Cockshott and

Allin Cottrell addressed the problem in a book titled "Towards a New Socialism"[26] and demonstrated that socialist calculation problem can be solved with simple computer algorithms and a computational method that has long been known. With these method, it is possible to calculate the inputs and outputs of all economic units and consumers and implement macro and micro-level planning for production and public services. Their model is one of the most popular and accurate models available, yet it still does not provide a perfect solution to effectively counter the problem of regeneration of capitalist production method. Additionally, in the Cockshott and Cottrell model, the planning institution is basically consisted of elite planners. They believe that economic planning should be carried out by individuals who are aware of it. This approach has an inherent risk of the economy being centralized - in ways that delegates the task of decision-making in the hands of a superior authority and makes workers subservient to it. Here, by reviewing the Cockshott and Cottrell approach, we introduce a model in which the systematic and cumulative system of capitalist value accumulation and money extraction from society can be eliminated without imposing power from above on the economic structures of society. In this model, the supply and demand system can provide up-to-date and accurate data on production and consumption with the help of a powerful computer system, and decision-making bodies can allocate resources and control the market (quasi-market) based on them. However, our model is ultimately a theoretical one and requires criticism and practical data to approximate its effectiveness.

The Share of Producers from Production in Capitalism

Let's see what value an hour of work produces in the capitalist system in the United States. To do this, we need to see how much is the total production in the United States. The Gross Domestic Product (GDP) of the United States, which represents the total production within the borders of this country, was $24,740 billion in 2021. Subtracting capital consumption from this amount gives us

the Net National Product (NNP), which was $19,483 billion in 2021. We can determine the monthly, daily, and ultimately hourly share of this amount for individuals employed in this country (the hourly NNP per capita) with simple calculations. In this way, if we consider labor as the only factor in producing exchange value in society, the average value of an hour of work in the United States in this year would be about $26, while the real federal minimum wage was $7.25 per hour.[27]

This means that if we give each American their share of production, each person would have an income up to four times higher (before taxes).[28] Of course, we are well aware that in every society, a portion of social work is dedicated to free services in the community - such as garbage collection, education, and also investment in the public sector like building bridges and railways - and in every society, regardless of whether its production is capitalist or socialist, workers allocate some of their income to these services. However, with a non-expert look at the above figures, one can easily observe the level of exploitation in the "home of democracy." While many vulnerable groups in America, including Latin American immigrants and people with disabilities, have real incomes of less than $7.25 per hour (which is the lowest wage level in all states) and are forced to work under the most difficult conditions, large corporations - those who became known as the "one percent" during the great financial crisis after 2008 - have been adding to their wealth every day even in the midst of global crises like the COVID-19 pandemic. The share of the cake that these large corporate bodies take for themselves is so large that if their wealth were distributed among the general population, American society would take on a completely different shape. We need not say more about the debts of students, private insurances, and the staggering military expenses that all directly burden the working class of the US. In this regard, the statistics speak for themselves. The capitalist system not only cannot effectively eliminate these inequalities, but it is itself the primary cause of them. Contrary to the belief of some economists who see the democratization of the market as a way out of these crises, it has long been proven for many socialists that the logic of profit accumulation cannot be based on providing the real needs of consumers; for example, if the market demands a product

whose production costs are not profitable for investors, it will not be provided.

However, no effective model of democratizing the market has yet been lied down that can eliminate economic inequalities and corruption - which in capitalism are not contrary to its nature but are the central mechanism moving its gears. While bourgeois economists consider "crisis" to be matters like inflation, recession, and unemployment, for left-wing economists, the real crisis is capitalism itself. A system that has fundamentally changed human production methods in a very specific way and has built a relatively efficient system (of course, not for the workers) based on exploiting humans. The difference between the left and right trends in political economy seems to represent an ideological contradiction. One side of the spectrum believes that profit logic is rational and drives the economy forward so that removing it means losing the efficiency of the system; while the other side believes that profit had no place in human economic relations until recent centuries and the economic machine that is now defining human relations is based on something that is by no means necessary.

The priority of the logic of generating profit over other logics simultaneously means consuming and wasting more natural resources in shorter periods. Isn’t severing the relationship between human and nature and putting natural resources at the disposal of those who have more capital to produce luxury and profitable goods one of the major crises of our time?

One political crisis that has gripped all capitalist societies today and has become the subject of discussion for political groups in recent years is the crisis of representation. The real-existing democracy in modern societies emphasises representing classes and segments of the population that participate in elections, sending their political representatives to legislative bodies and executive institutions of the government to support their demands. Elected representatives have historically tried to take their constituents' demands to the parliament by receiving continuous feedback from the people who elected them and representing more or less what the voters wanted. However, this policy has become very rare in recent years, and today the government - in the general sense of the word and in many places - represents the interests of capital and

economic entities more than ever before, rather than representing the desires of various segments of the population. Million-strong strikes and protests in France in 2023 against raising the retirement age from 62 to 64, political opposition in Greece against privatization and the sale of public property to multinational companies, and protests by German workers against crisis management to combat inflation (while many Western legislators prefer to allocate billions of dollars to the war in Ukraine and resist increasing workers' wages to combat inflation as much as possible) clearly indicate that firstly, general market policies are inconsistent with the daily needs of the majority of workers and employees, and secondly, these governments are representing people's desires less and less over time.

But how can real democracy be planned so that economic and political construction truly represent the will of the people? How can power be structurally entrusted to individuals who directly play a role in the process of value production while simultaneously eliminating economic inequalities?

Ideas like socialism and anarchism claim to offer necessary solutions for such programs; however, these claims have been less substantiated with concrete details. One of the main reasons for the lack of real socialist models is supposedly that since real and organized leftist forces have not provided clear and tangible ideological and militant infrastructures and struggles, and since the structure of institutions varies in different societies, presenting a comprehensive alternative of economic and political institutions in the future can only be of an imaginary and utopian idea. The consensus among marxist forces is that the socialist alternative must emerge from within the struggles of labor and communist movements, and the determination of the fate of economy by an enlightened elite or academic will not result in anything but imaginary socialism.

Of course, this consensus is correct. So far, dozens of socialist programs prepared for implementation by leftist activists and thinkers have not received much feedback for various reasons, including theoretical and political recession that has existed between leftist political forces in various societies until now, and these theoretical patterns have not been able to receive the

necessary momentum for their implementation from society and among political forces. In our view, the details of all these programs - which often have structural differences from each other - can be formulated by political and labor groups and at least practically implemented in a theoretical bubble; although most of them have not been able to effectively confront the resurgence of the capitalist system. The so-called communist systems in China and the Soviet Union were also among these alternatives. Political forces that could have been the guarantors of implementing such programs in the post-Cold War era are still in much earlier stages of formulating socialist programs, and their main priority is to create a social revolution that includes concrete conditions for confiscating ownership of the means of production and socializing it in their program. As we know, there is still no clear vision of achieving this goal, and for this reason, the discussion about the future that comes after the future cannot be the main subject of debate and hypothetical unity among leftist forces. Despite the fact that these groups introduce their alternatives with topics such as workers' councils, bottom-up intervention, free welfare services, and other slogans dedicated to the working class, none of these groups make constructive and effective efforts to explain the dimensions of such demands. According to us, if workers, women, minorities, and ultimately consumers are to choose an alternative that is structurally different from the existing system, the generalities of these alternatives must be somewhat clear in advance so that the whole society can recognize these alternatives and take effective positions towards them. Some of the questions raised by young socialists today indicate a lack of systematic alternatives: In what forms can workers' councils intervene in the process of value production and decision-making differently from the current state? If power is to be confiscated from the chaotic and militaristic system of capital, under which basic principles and to whom should it be entrusted? What is the general role of productive forces in the political structure of society?

Our intention is not to introduce a complete and precise alternative to capitalism. We also believe that an effective alternative will be presented at the right time under the existing balance of power among the forces involved in class struggle. Our

primary goal is to introduce a theoretical basis that these alternatives can use to shape their socialist framework. In this book, we attempt to provide an essentially insufficient answer to fundamental questions around the organizational structure of productive forces, fair distribution of value, and political roles or the participation of decision-making bodies among those affected by the decisions, both small and large, and their realignment. Our answer is nothing but an examination of an effective theoretical alternative and presenting it in a way that political forces can have a better understanding of their current slogans. Based on this, let us first address this question: If the role of the market, money, and generally the mode of production in society is to change, how will the calculation of value be? If the principle of accumulation of surplus value and profit for personal use does not exist, how can programs for value production and redistribution be formulated? What forms might socialist intervention take in the processes of a socialist society that are based on socialized labor and the extended needs of society? We will try to provide answers to these questions in the following chapters.

As we mentioned, Marx and Engels did not provide any written material on how to calculate the workers' share of production; however, Marx occasionally refers to a specific alternative based on the Labor Theory of Value. Our program is based on this theory. In the next section, we gradually delve into the issue of calculating the content of labor value and the income of workers[29] and, using the same solution of calculating workers' income per hour of work, examine the method to calculate the content of labor for all the products and services of the society. Then, in the macroeconomics chapter, we show how these two calculations are consistent and how a single unit of measurement can be used for all economic calculations in society (including production, exchange, accumulation, and redistribution of value). After that, we introduce the foundations of planning based on this approach and look at the dimensions of planning from macro, micro, and strategic perspectives. Furthermore, we will demonstrate that planning and adjusting economic variables do not necessarily require a centralized government or a centralized system, and planning policies can be formulated using the latest achievements in

information technology in ways that all value producers can participate in decision-making, so that the government can lose its classical meaning within this framework.

Value in Terms of Labor Hours

Marx attempts in the first volume of his book "Capital" to not only grasp the structural contradictions within the mechanism where capitalism deals with the production and exchange of goods but also to establish a basis for a different model of capitalism and market that prioritizes human needs over profit. In order to create a socialist model, we also need to first delve into capitalism, which governs the mode of production and exchange, and extract variables from its critique that can assist us in constructing a socialist model. Given that the critique Marx presents of capitalist economics (the formula for calculating prices and surplus value) is still widely accepted in academic circles and is relevant to our work, we believe that thinking like Marx can significantly aid us in achieving our goal. Let's see how Marx understands value.

Let's evaluate goods and labor - the foundation of production and exchange in society - from Marx's perspective. A material object carries two types of value: use-value and exchange-value. Anything material has a use-value as long as it serves human consumption. However, exchange-value has no direct relation to use-value (the commodity itself) but is a characteristic that the commodity acquires during the process of being exchanged with other commodities or with money. Let's illustrate use-value and exchange-value with an example. If you make an axe at home using wood and iron, it has a use-value. If you use it to chop wood and it's always available to you, its use-value remains constant but it has no exchange-value because it has never been exchanged. Therefore, this axe has no price because price is determined only in the process of exchange. Things like air have a use-value but no exchange-value because their usefulness to humans is independent of any labor performed on them.

So, use-value is a characteristic of any object consumed by humans, while exchange-value is a characteristic bestowed upon

commodities by society and has a social essence.

A crucial measure in Marx's analysis of determining exchange-value is the amount of labor expended in the production process. On one hand, it can be said that a commodity that requires more labor for its production has a higher exchange-value. However, some people spend more time producing a commodity that others could produce in less time. Does this mean that the commodity produced by lazy individuals or those using less advanced tools has a higher value? This important question leads us to two other aspects of each commodity.

The labor expended in production has both a quantitative and a qualitative aspect. The quantitative aspect is the amount of labor performed on the commodity, which is measurable and quantifiable. In contrast, the qualitative aspect of labor refers to the intensity of labor, the enjoyment derived from its production, or other qualitative aspects that are often not scientifically verifiable. Even the quality of daily work on a particular type of chocolate with a fixed price may vary. However, the mode of production has managed to create a market for exchanging commodities that have undergone different qualitative labor processes (for example, in the production line of a pencil factory, for unknown reasons, one worker produces two pencils every minute while another worker produces only one pencil in the same time, but the final prices of the produced pencils in this factory are the same). Marx believes that capitalism has socialized human labor to provide a framework in which commodities can easily be exchanged. Socialization of labor in this sense means taking the average labor of different individuals into account in order to standardize it for exchange.

So, if in our market it's possible to exchange a t-shirt for 20 kilograms of cotton, we have an equation in which different qualities are hidden on both sides, but due to the social nature of labor, these two qualities can be compared with each other and equated based on the quantity of labor expended on them or, in other words, they can be exchanged with each other. In order to equate the power of muscles or brain of one person with the power of muscles and brain of another person, labor must be seen in an abstract and separated from its reality. Thus, what matters to us here is exchange-value and how it is determined.

The question of what "value" is hidden in objects was one that always engaged Marx, and he tried through all his abstractions and explanations to reach the pure concept of value. As far as we know, understanding the value inherent in things in the context of a comprehensive theory of value is very difficult and perhaps impossible for modern humans. Pure value inherent in things is not something related only to society or economy but encompasses all human concepts: it's a complex chain of everything that gives value to a thing; however, exchange-value of commodities can be understood. When you exchange a t-shirt for 20 kilograms of cotton, you don't know what value is hidden in the cotton. You don't know what operations and how much labor has been performed on it. You only abstract based on weight and measure the value of the t-shirt relative to the value of the cotton. Here, although the initial value of cotton is unknown, buyers and sellers can approximate its value, and in this way, cotton and t-shirt can be exchanged with each other. This social characteristic of labor and exchange demonstrates the value of commodities, which has a history older than capitalism.

In the the process of exchange, quantities are important to us. We must be able to measure and compare the quantity of human labor. Since various types of human labor exist with various qualities, we can only find a quantity common to all labor by abstracting from human labor. Adam Smith, Ricardo, and Marx claimed that this quantity is labor hours spent in producing goods. All goods and services offered in society share a common characteristic: the number of hours an average person (taking into account the average workload of workers compared to each other) has worked on it. Therefore, from the work of both the lazy and the industrious individuals, an average must be taken, which Marx called "socially necessary labor." The market can only determine the value of things by simplifying different qualities and equalizing equivalent quantities.

This is exactly what we must do to determine value in a socialist society. In capitalism, the price (value) of goods is determined by the following formula:

$$P = c + v + s$$

In this formula, **c** represents the initial capital, **v** represents the variable capital, and **s** represents the surplus value. If you are a capitalist who has established a bottled water production factory, you use this formula to determine the initial price of your product. Initial capital is essentially the capital spent on purchasing or renting production premises, purchasing or leasing production machinery, and tools and raw materials needed for production. Variable capital includes the amount of wages you pay to workers. This amount is determined based on the hours worked by workers and initially has no relation to the quality or intensity of their work. Finally, some extra value is added to the price of the product, allowing the capitalist to purchase new machinery and tools, compensate for potential losses, pay off debts and interests, and ultimately buy a villa overseas. Fixed capital is so named because it always returns to the capitalist at the end of the production process. Thus, based on the above formula, if the price of a commodity is to be minimized to be able to compete with other producers, one way is to reduce the wages of workers, which has a long-standing history in capitalism. Another way is to increase the workload, which can be achieved by using more modern and faster tools or by exploiting workers more, and ultimately reducing the surplus value, which may only be achievable for the capitalist in the short term.

As you can see, workers receive a wage in the production process to sustain their daily lives and their families', but at the same time, they are also producing value to buy villas for the shareholders. They know that part of their work goes into buying a villa they themselves are not allowed to use, but in most cases, they believe this is their only chance: it's better to work and build a villa for the capitalist than to lose their lives due to starvation. Since this surplus value exists in all long-term production relations in capitalist production, the worker is not free in refusing to build a villa for the capitalist, and with every economic activity, part of his work goes towards the significant expenses of the capitalist (or production shareholders). The goal of socialism is to eliminate this exploitation factor.

In socialism, like capitalism, work is seen as a social activity, and a commodity that is not shared with others has utility (or

use-)value but not exchange value. Only a commodity that can be exchanged among members of society has value. However, the prices of goods in socialism are calculated in a different way. In the first chapter of Capital, Marx presents readers with a symbolic example. Here, the story of Robinson Crusoe, who is stranded on a remote island, is recounted. He has nothing in his possession except a watch, a pen, ink, and a notebook, and is forced to perform complex tasks daily for his survival. He soon realizes that to optimize the use of his labor force and with the use of tools he brought to the island, he can easily record the value of his work, understand how much time each task takes, and thus plan his economy. Marx extends the story of Robinson Crusoe to "a community of free individuals, carrying on their work with the means of production in common, in which the labour power of all the different individuals is consciously applied as the combined labour power of the community. All the characteristics of Robinson's labour are here repeated, but with this difference, that they are social, instead of individual."[30]

Marx and Engels expand this idea much further in Anti-Dühring, Capital, The Critique of the Gotha Programme, and several other works. The question is, in the absence of money which serves as a commodity form for measuring value, is not itself consumed and carries countless contradictions within itself, how can one calculate the value crystallized in goods?

If we assume that in socialism the physical space of the factory and all means of production and raw materials are freely available to producers, the resources needed for renovation, reproduction of production tools, and workplace damages are not provided by the local unit managers but are provided free of charge by the society, and also surplus value is completely removed from the production cycle, we will arrive at a simpler formula for determining the initial price of the final product, which is devoid of complexities present in the commodity production system and is directly and solely based on the hours worked on the commodity. In the following chapters, we will explain how socialism can meet the assumptions we have raised here, but here, assume that we can eliminate worker exploitation, and no worker will work for another individual's personal profit, and the community will provide the tools and

materials needed for production in a centralized and precise system to producers. Therefore, in a non-competitive market and in a society where the price of goods is not determined by market indices, the above formula can theoretically be reduced to the following:

Final value of commodity = Value of all labor performed on it

So if a factory produces 100 pairs of shoes in a day and has 10 workers who each work 8 hours, the value of shoes is calculated as follows:

Value of 100 pairs of shoes = 80 hours worked by shoemakers + 500 hours worked by workers in other production units

So, for the production of 100 pairs of shoes, 580 hours are needed, or in other words, 5.8 hours of work are consumed for each pair of shoes. Note that in the above equation, the amount of 500 hours represents the total hours of work required for the production of shoe straps, soles, the metals needed for the holes around the straps, thread, fabric, dye, and all other items needed to produce shoe which are produced by other units in different locations. The workers in the shoe factory themselves do not know the exact amount of work needed to produce each of these items, but the pricing system in the market has a simple way of providing this information to the shoe factory: each of these items has a price tag that the owner of the shoe factory can pay and provide them to her shoemakers to complete the product. Now, in the absence of a market-based pricing system and the commodity production method, our shoemakers have to acquire this information in a different way. Until the 1950s, many economists believed that calculating the labor content for all raw materials and all goods in the economy, even if possible on paper, is practically impossible due to the tremendously big number of interrelated goods and services in the society. We'll delve into this issue in more detail shortly.

With this calculation, what wages do workers receive? By substituting the general formula for determining exchange value

production in the commodity production method with the above formula and using working hours as a universal and comprehensive indicator for calculating the value of goods instead of their prices, we can conclude that each worker can receive the same amount of value that they contribute through their work. In other words, for every hour worked in the production process, they receive an equivalent credit from society. They can receive a certificate for this one hour of work and use it to obtain any commodity in society that has a value equivalent to one hour of labor for their personal consumption (we call this certificate "token" in the chapters of this book). With this calculation, all production and consumption can be measured in terms of working hours. Each token has a value equivalent to one hour of labor in society. Decreasing or increasing the intensity of work or changes in the technology of production tools do not affect the amount of these tokens.

Of course, this idea was not invented by Marx or Ricardo, but was rather proposed by Robert Owen[31], who considered himself a socialist at the time of Marx's birth. Marx discusses this "labor money" or "work certificate" proposed by Owen as follows:

> "... Owen's 'labour-money,' for instance, is no more 'money' than a ticket for the theatre. Owen pre-supposes directly associated labour, a form of production that is entirely in consistent with the production of commodities. The certificate of labour is merely evidence of the part taken by the individual in the common labour, and of his right to a certain portion of the common produce destined for consumption."[32]

Based on this, not only can we easily determine the share of each individual in the produced product, but we can also determine the labor content of all products. The final product includes some indirect labor that is shown in the form of initial capital (fixed capital) in the commodity production method. Indirect labor means work that other workers have previously done on raw materials or machinery used in the new factory so that these raw materials and machinery are made available to workers in the next factory. To simplify understanding, let's introduce two terms. The product produced by a factory or company is called the "final product". To produce the final product, workers need "intermediate products".

Intermediate products are produced by other factories and are provided as raw materials to the final factory or company. So each final product can be an intermediate product of another company. Now the question is, how can we determine the labor content of all products based on the above calculation and in terms of time?

To produce a pair of shoes (final product), a large number of intermediate products are needed, which each factory initially calculates the required amount independently and purchases from other factories. This is done in the market system using money. In the commodity production method, money represents all labor and exchange value in goods, and the buyer, without needing to know the production method, the specific load-bearing capacity of each production unit, and the amount of labor force spent on it, pays for the product by paying its price or cost. By removing money and the market from the model, we need to answer the question that has puzzled economists for decades: How can the labor content of all products, both final and intermediate, be determined?

After the 1980s, an efficient answer to this question was provided, which put an end to the bulk of the socialist calculation debate forever. Using this method, we can calculate the amount of work needed to produce all intermediate materials for a shoe, then add it to the final work of the shoemakers to calculate the production cost of all produced shoes. This method is known as input-output method. We will explain this using the same example of the shoe factory.

Imagine a shoe factory needs 6,000 shoe straps, 40 kilograms of dye, 50 kilograms of plastic, two reams of A4 paper, and 2 kilowatt-hours of electricity to produce 3,000 pairs of shoes per month. The factory also employs 10 full-time workers. If we remove profit and surplus value from the calculations, the monthly production cost of the shoe factory is the sum of the costs of these items plus the labor of the workers in this production unit.

OBJ

	Shoe-lace	Dye	Plastic	A-4 Paper	Electricity	Direct Work
Shoe	6000	40	50	2	2	10

Table 1-2 (input or intermediate products required for shoe production over time)

We previously showed that the direct work needed for the monthly production of shoes by the shoe factory is calculable. Each factory knows exactly how many hours its workers work to produce a certain number of products per month. What the shoe factory doesn't know is how many hours of work are needed to produce dye, which is an intermediate product for shoe production. While this information is unknown to the workers of the shoe factory, it is clear and calculable to the workers of the dye factory. The amount of direct work needed to produce 50 kilograms of plastic, 2 reams of paper, and 2 megawatt-hours of electricity can all be determined with a good estimate by the workers of the respective factories.

Therefore, it can be said that for the production of each pair of shoes, for example, 0.8 hours of direct work and, using data from other factories, hypothetically 1.2 hours of indirect work (work required for the production of dye, plastic, paper, etc.) are needed. So it can be concluded that two hours of work are needed for the production of each pair of shoes in total. By calculating the labor content of intermediate products, we no longer need to calculate their value in terms of price. Prices in capital markets consist of capitalist profit, loan interest, and other factors that can be removed in a socialist production method, and the needs of each factory, whether raw materials or indirect labor, can be calculated solely by calculating the labor content of intermediate products.

This simple method can be applied to the entire economy. For example, if the workers of the shoe factory need 2 megawatt-hours of electricity as an intermediate product per month, the workers of the electricity factory also need three pairs of shoes per month (these three pairs of shoes are used in the factory environment and are not a product that the worker independently procures for personal consumption). With this calculation, a table of the cost of all final products in terms of intermediate products can be compiled, which is something similar to the table below:

	Shoe	Electricity	Oil	A-4 Paper	Dye
Shoe	2	2	0	2	40
Electricity	3	0	80	22	0
Oil	5	200	2.5	4	3
A-4 Paper	3	60	0	0.3	5
Dye	5	40	50	4	2

Table 2-2 (input data calculated per unit of each intermediate product)

Based on the above table (which is filled with hypothetical data), to produce each kilowatt-hour of electricity, three pairs of shoes, 80 barrels of oil, and 22 reams of paper are needed. For each ream of paper, 3 pairs of shoes, 60 kilowatt-hours of electricity, 0.3 reams of paper, and 5 kilograms of dye are needed. It is somehow important to mention that we only use simple words "paper" or "shoe" for simplicity. The paper or shoes produced by each company are different from other companies, and each company has different models of outputs each of which has its own row and column in the input-output tables so that the required number of intermediate products for each product can be calculated accurately. The cells of this table are initially filled with units related to the measurement of each cell. For example, the measurement unit for all data in the electricity column will be kilowatt-hour and the measurement unit for all data in the dye column is kilograms.

Therefore, the gross output of each product (the number of products produced by each factory or company) is calculated based on the amounts of intermediates in the following manner:

$$G_1 = I11 + I_{12} + \ldots + F_1$$
$$G_2 = I_{21} + I_{22} + \ldots + F_2$$

Formula 2-2 (output quantity for each production unit)

In the above formulas, G represents gross output, I represents intermediate output, and F represents final output or the number of final products available to consumers. The variable I is represented

with two indices i and j, as I_{ij}, which signifies the quantity or amount of intermediate product needed to produce product i in industry j. The first equation shows that to calculate the total number of shoes needed in society (G_1), first we need to see how many shoes the shoe factory itself needs (I_{11}), then we need to see how many shoes are needed in the electricity industry (I_{12}), and after calculating the number of shoes needed by all economic sectors, we need to add these values to the number of final products required by end-consumers, those who buy shoes for personal consumption (F). Thus, if this table is always up-to-date, producers will always know the amount of output of their industry, which is used in all sectors of society - including intermediate industries and final consumers.

More explanation about variable F will be provided in Chapter 6.

From here on, planners need to answer two questions to calculate the labor content of all products. First, who and how fills the cells of this table, and second, given the extensive variety of the rows and columns of the table, how can these values be calculated? The answer to the first question will be provided in Chapter 3. However, computational methods for solving these two equations have been available to mathematicians since the 1930s and 1940s, and it is possible to solve these equations -which used to take years before the invention of computers- within a few minutes using various computational methods. It is quite clear that calculating the above equations from a table with many interdependent variables and millions of rows and columns without a computational algorithm seems impossible. Varga addressed the solution to such a matrix in an article[33] he wrote in 1962, and Cottrell and Cockshott referred to it in their book.[34]

So, using Table 2-2 and the provided computational formula, we will be able to calculate the number of goods required by society. To calculate the value of these goods, we can determine the labor value of all goods by extending the values of the above table to "hours." If the dye production factory knows how many hours its workers work directly for each kilogram of dye, and similarly, the shoe production factory, this table can be transformed into a table where the unit of measurement for all rows and columns is labor hours. By knowing the amount of work required to produce the

necessary products for the shoe factory and also having the amount of direct work that workers in the shoe factory perform to produce shoes, the total amount of work done on each shoe, and therefore the value of each shoe in terms of labor hours can be calculated. A consumer can then, as explained in subsequent chapters, purchase a specific pair of shoes by paying this value for personal consumption.

OBJ

	Shoe	Electricity	Oil	A-4 Paper	Dye
Shoe	0.02	4	0	0.5	22
Electricity	6	0	150	11	0
Oil	10	400	0.02	17	13
A-4 Paper	6	344	0	0.01	14
Dye	10	80	89	2	0.1

Table 2-3 (input data calculated per hour for each intermediate product)

So, Table 2-3 serves two important functions. Firstly, a central system can accurately estimate the required raw materials and labor for all economic units in society using its data, thereby calculating the rate of goods or services precisely (in terms of labor hours). Secondly, if this table is directly accessible to producers and they can update their data on this table, they can use it as a ordering system for raw material and intermediate products from another industry (even automatically). In the next chapter, we will delve further into these two functions of the table.

This table also inherently takes the productivity for producing each product and the impact of technology on production output into consideration without the need for applying extra calculation (based on prices or other measures). If two separate shoe factories produce shoes and one has less productivity than the other, it will produce fewer products or spend more hours producing, which is taken into account here in a linear way. Eventually, using the formulas extracted from these tables and determining the final value of goods (formulas similar to formula 2-2 written based on

labor hours) will determine the exchange value of a company's products compared to another company's and will be used by planners (at both micro and macro levels). A raw prediction here is that in a socialism that chooses the mentioned pattern to determine value of products and services, companies with lower productivity than others will merge with companies with higher productivity, or if consumers are not interested in their products, they will have to increase their work efficiency by requesting optimal resource allocation and machinery, or ultimately change their profession.

In this chapter, we have answered the question of how the calculation of the value content of goods and services can be in a socialized production method following the allocation of the means of production to workers and the elimination of the classical market. We also showed that workers in this system can receive credit from the community based on the hours they have worked. In the following chapters, we will delve into the details of supply and demand dynamics and socialist planning and demonstrate how all economic processes can unfold through a mechanized process with the participation of institutions affected by economic decisions.

Application of Input-Output Tables in Capitalist Economy

The input-output tables introduced in this chapter have a long history and many applications in economics and statistics. These tables were introduced by Wassily Leontief, the winner of Nobel Prize in Economy in 1973, and are now used not only by many countries worldwide but also by the United Nations to examine the relationship between various production and service sectors and to lay down economic forecasts. In the input-output table, it is assumed that the input (goods, services, labor) used to produce a product have a direct relationship with its output according to a linear production function, and this production function, at least in the short term, has constant coefficients. Therefore, the linearity of the production function and the constancy of its coefficients are fundamental assumptions that must be considered in input-output analyses.[35]

In the tables used today by the Statistical Center of Iran and the economic and statistical organizations of other countries, input-output data is prepared in monetary units, physical units, or a combination of both, and technical data is extracted from them. In the model we introduced, the data is entered into the table based on the physical unit of each product and then, based on the labor hours of intermediate products for producing one unit of final product, to obtain non-monetary relationships between relevant economic units. These tables

INDUSTRY PRODUCING		1 agriculture and fisheries	2 food and kindred products	3 textile mill products	4 apparel	5 lumber and wood products	6 furniture and fixtures	7 paper and allied products	8 printing and publishing
agriculture and fisheries	1	10.86	15.70	2.16	0.02	0.19		0.01	
food and kindred products	2	2.38	5.75	0.06	0.01	•	•	0.03	•
textile mill products	3	0.06	•	1.30	3.88	•	0.29	0.04	0.03
apparel	4	0.04	0.20		1.96		0.01	0.02	
lumber and wood products	5	0.15	0.10	0.02	•	1.09	0.39	0.27	•
furniture and fixtures	6			0.01			0.01	0.01	
paper and allied products	7	•	0.52	0.08	0.02	•	0.02	2.60	1.08
printing and publishing	8		0.04	•					0.77
chemicals	9	0.83	1.48	0.80	0.14	0.03	0.06	0.18	0.10
products of petroleum and coal	10	0.46	0.06	0.03	•	0.07	•	0.06	•
rubber products	11	0.12	0.01	0.01	0.02	0.01	0.01	0.01	•
leather and leather products	12			•	0.05	•	0.01		•
stone, clay, and glass products	13	0.06	0.25	•	•	0.01	0.03	0.03	
primary metals	14	0.01	•		•	0.01	0.11		0.01
fabricated metal products	15	0.08	0.61	•	0.01	0.04	0.14	0.02	•
machinery (except electric)	16	0.06	0.01	0.04	0.02	0.01	0.01	0.01	0.04
electrical machinery	17								
motor vehicles	18	0.11	•			•			
other transportation equipment	19	0.01						•	
professional and scientific equipment	20						•	0.01	0.03
miscellaneous manufacturing industries	21	•	0.01	•	0.26	•	0.02	0.01	
coal, gas, and electric power	22	0.06	0.20	0.11	0.04	0.02	0.02	0.12	0.03
railroad transportation	23	0.44	0.57	0.09	0.06	0.14	0.05	0.22	0.07
ocean transportation	24	0.07	0.13	0.01	0.01	0.01	•	0.02	•
other transportation	25	0.55	0.38	0.08	0.03	0.14	0.04	0.12	0.03
trade	26	1.36	0.46	0.23	0.37	0.06	0.06	0.18	0.03
communications	27	•	0.04	0.01	0.02	0.01	0.01	0.01	0.04
finance and insurance	28	0.24	0.15	0.02	0.02	0.08	0.02	0.02	0.02
real estate and rentals	29	2.39	0.09	0.03	0.10	0.02	0.02	0.03	0.06
business services	30	0.01	0.63	0.07	0.10	0.02	0.06	0.02	0.06
personal and repair services	31	0.37	0.12	•	•	0.04	•	•	0.02
nonprofit organizations	32								
amusements	33								
scrap and miscellaneous industries	34			0.02				0.25	
eating and drinking places	35								•
new construction and maintenance	36	0.20	0.12	0.04	0.02	0.01	0.01	0.04	0.01
undistributed	37		1.87	0.30	1.08	0.73	0.27	0.17	0.50
inventory change (depletions)	38	2.66	0.40	0.12	0.19	•	0.01	0.09	0.03
foreign countries (imports from)	39	0.69	2.11	0.21	0.28	0.18	0.01	0.62	0.01
government	40	0.81	1.24	0.64	0.38	0.34	0.11	0.50	0.34
private capital formation (gross)	41	DEPRECIATION AND OTHER CAPITAL CONSUMPTION ALLOWANCES							
households	42	19.17	7.05	3.34	4.24	2.72	1.12	2.20	3.14
TOTAL GROSS OUTLAYS		44.26	40.30	9.84	13.32	6.00	2.89	7.90	6.45

From "Input-Output Economics" by Wassily Leontief, 1986, Oxford University Press

also play a crucial role in formulating national accounts and gross national product since the 1960s for calculating the overall technical indicators of a country or region's economy. The

Statistical Center of Iran has published tables related to national and regional accounts from 1986 to 2016, which are available on its website. These statistics are generally filled with Rial unit data. Through using the method introduced in this chapter, the value of these data can be approximated to labor value (hours worked related to these data), and a statistical framework of various sectors of the Iranian economy can be calculated based on total hours worked for production. It is worth mentioning that due to the perpetual disparity between prices and labor content in the market system, this calculation involves complexities that question the assumption of linearity, but such calculation may generally be possible considering assumptions beyond the scope of this text.

Unicorn Supply and Demand System

Before delving into the political function and decision-making role of societal labor institutions in socialism, it is necessary to explain the system of supply and demand. This is a contentious issue among various economic schools. As previously explained, many economic schools seek to minimize the role of planning, believing that any planning disrupts market equilibrium. On the other side of the spectrum, supporters of socialist models based on planning grant too significant a role to planners who centrally plan for the economy and production units. In this chapter, we demonstrate that neither of these approaches is conclusive and present a different pattern for addressing the issue of supply and demand and the basis for mechanizing the data used in regulation and planning.

In the previous chapter, we stated that in a socialist society, each person receives credit from society according to their work, and individuals can use this credit to meet their daily needs. However, in a healthy economy that preserves the interests of all people, a portion of the value produced in society should be allocated to cities and villages and spent on public services. Thus, all capable individuals should fairly contribute a share of their work to society. In order for societal decision-makers to have a comprehensive view and knowledge of the economic trends and indicators of supply and demand, economic data could be seen as a stream of centralized data that are made accessible by these institutions and is at the meantime available to them as a whole. The advantage of a centralized and mechanized supply and demand system is that individuals can have a holistic, precise, and transparent view of the efficiency of all economic entities and by considering all factors related to production, distribution, and the interconnection of these factors, have the opportunity to make more accurate decisions. We will further explain how this can be managed in a way that prevents any institution from intervening in the system in an undemocratic

way.

Unicorn -as we suggest here is a computerized system at the forefront of production and consumption relations. In the Unicorn system, we consider two main treasury funds: Fund 1 and Fund 2. These two treasury funds encompass all the credits (tokens) consumed in society in such a way that Fund 1 -if necessary- generates credits for Fund 2. The relationship between these two funds is such that tokens always move from Fund 1 to Fund 2, and no token is deposited from Fund 2 to Fund 1. This one-way relationship is designed to prevent the circulation of consumption credits in society and minimize their accumulation. At the beginning of its operation, Fund 1 allocates credit to Fund 2 based on forecasts and financial balances, equivalent to the total gross production or total consumption credits (total tokens) approved by society annually. The task of Fund 1 is to record the total allocated tokens to Fund 2 for general auditing and record the amount of tokens allocated to Fund 2. The balance in these two funds and all their transactions will be visible to the public.

All tokens spent by society for purchasing consumer goods and services are deposited into Fund 1, and the balance of this fund will be zero at the end of the financial period to prevent the accumulation and circulation of tokens in the system.

The task of Fund 2 is to allocate resources to individuals, economic and political institutions, and facilities. As explained in the previous chapter, individuals receive credit (tokens) from Fund 2 based on the hours they work. Thus, Fund 2, which is the primary fund for disbursing tokens to the general population, is at the center of the Unicorn system, and individuals obtain credit from it with the necessary approvals.

Labor councils record individuals' working hours in the Unicorn system, and each person receives an electronic token based on the hours of services performed and registered in this system. If someone works 44 hours a week, they will receive 44 units of credit (consumption tokens) from this box, which (after deducting approved taxes - Chapter 4) could be used to access the community's goods and services.

The Unicorn system also introduces a large virtual marketplace that encompasses all economic and political transactions of society.

These transactions are stored in a blockchain and the history of each transaction can be easily tracked by the public. It is evident that the use of such a system in a market-based capitalist system will not be possible due to its complete transparency; because the labor and commodity markets in capitalism benefit from lack of transparency (in some cases including in the final price, profit margin, and surplus value).

Unicorn is by no means the economic system itself. It is only a representation of the economic life of the society in a universal application that uses the data to calculate the price of goods and income with the use of input-output tables while offering more to its users.

As explained in the previous chapter, the value of all buying and selling prices could be calculated based on working hours and using the input-output tables available to everyone. Therefore, the necessary credit to buy a flowerpot, for example, would be 0.1 units of token as would be 880 units for a car (because 0.1 working hours have been spent directly and indirectly on producing this specific flowerpot in total, and 880 working hours have been spent on producing that specific car in total).

Every individual and economic and political entity owns an account on this system. Each individual can simultaneously be a producer and a consumer. Therefore, one can receive credit from Fund 2 and spend it in the market (whether online or in physical markets).

Factories and companies register the amount and source of intermediate products they need for production as well as the amount of direct labor they expend for production on their user profile. For example, the current responsible of a shoe factory will register the necessary items for weekly or monthly shoe production along with the up-to-date output of the factory on their unit profile. In this way, the number and amount of shoe laces, paint, plastic, electricity, and work hours required for producing a certain type of shoe will be registered on Unicorn. Unicorn will automatically register these items on table 2-2 and order the requested amount of intermediate products needed by the shoe factory from the producers of those items. It is

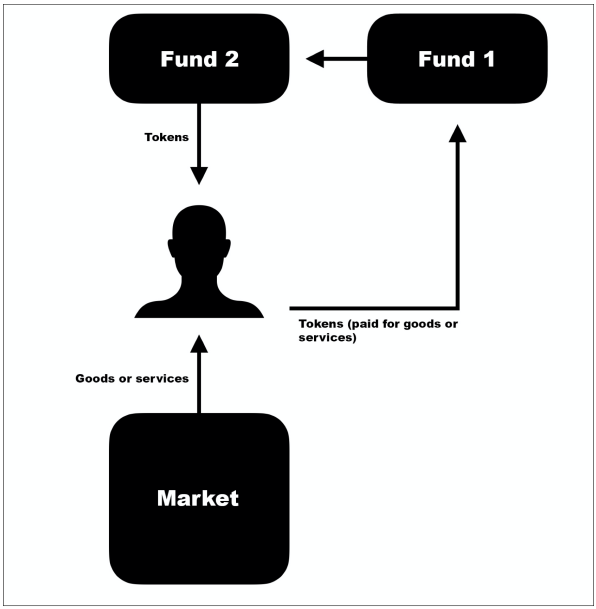


Figure 3-1 (Relationship of funds with consumers and the process of exchange)

worth mentioning that there is no cost for trading intermediate products between factories and companies. Companies do not have financial transactions with each other, and everything is calculated based on the central data table. Unicorn also calculates the final value of the consumer goods based on the latest data from the hours worked on intermediate and final goods for each company. The value of each item is the sum of the direct and indirect labor for producing that item. What remains is the value of raw material, which will be discussed in Strategic Planing, but to put here shortly, the raw material like oil or wood of a tree have no price tag. The use of them is planned according to their availability and provisions on using them.

Therefore, since the allocation of credit for renovation, changing the raw materials to usable products and intermediate products, and payments to workers are provided by Fund 2, these credits are obtained from the sale of products to final consumers. (This is similar to Capitalism market where the end-user eventually pays for the whole amount of the product and service they obtain.) The

exchange value of each item is made available through calculations made on the central input-output table, and consumers can purchase the necessary goods and services by paying this amount of tokens to Fund 1. Thus, the initial pricing of goods and services is done automatically, and no one interferes with the process, and the value of each item is nothing but the number of hours worked on it. It is worth mentioning that with this method, the parties to the transaction (especially the producer or seller of the product) will not benefit from determining the amount of raw materials beyond what is needed by their unit because these items are made physically available to them by other production units with the help of Unicorn to proceed with production, and no money, credit, or token is transferred to individuals and companies for this purpose. Therefore, increasing the number of items needed to produce items will not lead to profit or surplus for the producer because the amount paid for the purchase of consumer goods is directly deposited into Fund 1 by consumers.

In the formula for determining the output of economic units, given the known resources consumed by each production unit for the production of one unit of goods, the only unknown factor is the amount of consumption by consumers (F). Demand patterns are very dynamic and fundamentally complex. Demand in a competitive market depends on factors such as the price of goods related to a product, income, the number of buyers, consumer expectations of future conditions, indifference, and desirability. The sum of these factors carries such complexity that economists have usually no other choice than to consider many of the above factors as constant to be able to study the amount of demand in the market, and to consider demand as simply a function of price. In a socialist society, most of these factors will most likely still successfully represent qualities in the economic life of people, and in most cases, real changes in demand can only be analyzed after it has deviated from existing models. However, some economists have attempted to assign the task of determining demand directly to consumers themselves instead of modeling it. Daniel Saros has theorized a method for determining the amount of community consumption in his recent book.[36] According to his model, consumers register the goods and services they need for the next

month on an online catalog for them to be shared with producers. This method does not seem very practical because we must assume that individuals may not know the exact quantity of items they need for the next month, and these quantities are constantly changing. Applying such a survey by all consumers and forcing them to order the goods they need before they need them does not seem practical for various reasons.

In any case, Unicorn records supply and demand curves and provides reports to companies and planners. To determine the initial curves during the transition to socialism, it is assumed that the workers of each production unit have already a good estimate of the demand for their goods and can continue production as defined in the earlier commodity system. Unicorn can then -using algorithms to examine consumption patterns- suggest increases or decreases in production to workers' councils and unions.

In Unicorn, the resources used for production and workers' payments are provided not by working units but directly by Unicorn and from the sale of goods and services to the public. The resources needed for the production of intermediary products, as explained in the previous chapter, are calculated in the price of each product, so as mentioned, there is no financial exchange between companies (whether for tools or intermediary products), and companies provide each other with the necessary products based on the central dataset. Unicorn allocates resources and labor to companies and factories based on decisions made in strategic plans and micro-plans. By making this change, the possibility of accumulating value by individuals is eliminated or minimized, and the need to take coercive action against production actors to remove the vestiges of capitalist reproduction is greatly reduced.[37]

However, as we mentioned, after several cycles, Unicorn is able to estimate the approximate consumption of all producers and consumers even without using Saros' proposed system. With accurate models of actual consumption amounts, Unicorn can provide planners with the opportunity to make more precise decisions to improve the activities of production and service sectors. The cost of goods and services is determined automatically by having a list of orders for intermediary products and the amount of labor expended on all these products registered by production units

on Unicorn, and without the material incentive to receive profits, the final prices of goods will be based solely on the total labor expended on them. Therefore, the supply and demand market here have a fundamental difference from competitive markets. Here, everyone receives tokens from the community (Public Fund No. 2) based on the amount of work they perform in the community. This is in contrast to competitive markets, where production units determine a price for their goods, and the buyer pays the approved price directly to them during the purchase process. In a capitalist market, producers can determine a higher or lower price for products depending on decisions made by the board of directors and based on policies approved by shareholders and investors. This often leads to the accumulation of capital or loss in the unit (or competing units) and can also put unnecessary pressure on consumers and is only imposed to create equilibrium in the supply and demand market. The principle in a market-based competitive system is that if demand for a product exceeds the amount produced, the price of the product will be raised to a level that some consumers will no longer be able to or do not want to purchase it, and with reduced consumption, balance will return to the market. This change in price is not proportional to changes in the cost of raw materials and labor expended on the product, but is simply a decision to control the market. In our proposed system, firstly, producers and managers of production units cannot arbitrarily determine the value of their goods or services for reasons such as having exclusive production rights for a product. With the cost of production known for each product and the share of producers in the social production process, the total cost of all goods is automatically determined and only changes when the initial costs change. These initial costs depend on the cost of raw material production (discussed in the strategic planning) and changes in production technology and loading. Given that all producers have a fixed hourly income everywhere, changes in production costs also have no direct effect on the income received by producers. The automatic determination of prices for goods and consumer services is something that was impossible in previous decades before the advancement of computer algorithms, and economic actors were forced -for reasons such as competition or

repayment of huge bank loans, to interfere with prices or set prices disproportionate to production costs and final profits. However, using accurate and linear algorithms, Unicorn is able to calculate the exact prices of consumer goods and immediately implement them in the market. Nonetheless, supply sometimes requires adjustments, which we will address in the chapter on micro-planning (Chapter 6).

The Limitations of Information Technology

Now we must answer an important question. What general drawbacks does the focus of all economic and political activities of society on a centrally connected program linked to communication networks face? Is such a thing desirable or even possible?

Individuals in the market system can easily engage in economic activities by simply estimating the balance of their wallet and meet all their economic needs through the exchange of money, goods, or labor. Market relations are simple but volatile and risky, and exploitation and deception are fundamental principles therein. In contrast, the mechanism we have introduced here for establishing communication between various sectors of society requires internet or intranet connections, and this, given the centralization of all information and its visibility to the public, can lead to risks for society. Additionally, individuals should be able to carry out their financial and work interactions and engage in social activities individually in the absence of constant access to computer networks. In our view, the electronic form of the supply and demand system introduced here will not create any serious constraints in any of the above cases.

The growing prevalence of information technology to internet users worldwide has enabled them not only to dedicate a significant portion of their lives to these systems but also to create systems that serve everyone without the need for monetary relations and profits. Websites like Wikipedia are among such websites. Wikipedia is one of the largest and most popular services on the internet run by all those interested in taking part in its moderation, who edit and produce content on it without significant scientific or political

hierarchies. The horizontal and collaborative structure of this website allows individuals to contribute to the expansion and improvement of the site solely out of personal interest and motivation, and this dynamism, almost entirely outside of monetary relations and profit motives -precisely due to the collective participation, has made this website a major source of human information. This does not mean that there are no executive hierarchies in managing this site; rather, individuals, despite these hierarchies, can effectively contribute to creating their desired content.

Moreover, today, individuals have placed a large portion of their personal information on various databases on the internet, but due to issues such as monopolies on value production, private ownership of cultural means of production, and the incentive of extracting profit from personal information by private companies operating on a capitalist mechanism, privacy and protection of personal information have become major issues. In contrast, in a system where deceiving others for personal gain is not possible or desirable, all political and economic transactions of society are open and visible to the public, and by preventing the registration of sensitive and unnecessary personal information on communication networks, the issue of individual privacy, like other changes that socialism will bring to social relations, appears in a different light.

People can use their plastic payment cards or mobile devices to use the payment gateways available in physical and non-physical stores or use these same means to sell their products. The opportunities that an open payment gateway system provides individuals and businesses with is much more extensive than the restrictive system on which the capitalist world is based. Anyone who offers services needs to register it only once. After obtaining the necessary permits through Unicorn, requests for receiving necessary intermediary items and the confirmation of these requests by relevant authorities can be made on Unicorn to be able to use the online or offline marketplace using a payment gateway installed on mobile phones. The amount paid by customers to sellers is deposited into Fund 1 by connecting to the online gateway and comparing it with the amount set on Unicorn, and the purchase transaction ends in this way. These gateways do not always need to

be connected to communication networks (internet or intranet) to update prices and sales and production statistics; these data can be stored offline and synchronized with the servers in the presence of these networks. Therefore, in situations where there is no network connection, economic transactions do not stop. Furthermore, as we explained previously, the seller will not directly profit from higher prices for goods and services, and in addition to that, individuals will have no major reason to disrupt the system or disconnect their network connections for gaining profit.

Moreover, as we mentioned, people need to be able to participate in society without any knowledge of electronic devices. Centers in cities and villages, such as registration organizations, can play a mediating role in such cases and assist individuals in pursuing financial, economic, and political matters that are available to public through Unicorn. It is worth noting that such systems today also registers user information in scattered form in all countries around the world. Civil registration offices, police departments, banks, and tax authorities in capitalist countries store much of the same information that is registered on Unicorn. The important issue would then be to securing these systems.

As far as malicious actions or hacking systems are of concern, these actions are carried out with different motives in all cases. Full transparency of transactions on the system and continuous work by a large community of experts on the open-source codes of the system reduces motivation and the possibility of hacking. This system can also use a parallel network with the internet and outside of it to minimize the likelihood of many accidental or deliberate actions against its integrity. In all these cases, abundant literature and codes can be found explaining how major websites continue to provide services despite constant attacks on their structures.

The Ticketing System

An efficient economic system that is not based on money should represent the complexities of society in other forms. The Austrian school has taught us that the problem in economics is not merely calculation and allocation of limited resources, but rather how to socially mobilize and utilize the scattered and fragmented

knowledge of individuals and production actors. Hayek says that the economic problem facing society is not how to optimally allocate resources given full knowledge of the available means but rather "it is a problem of the utilization of knowledge which is not given to anyone in its totality."[38]

Besides managing production and supply and demand, Unicorn has another very important property, which, as mentioned, is considered one of the foundations of decentralization and democratization of planning policies; but more importantly, it is designed to address the incompleteness of information and knowledge of small administrating groups and planners, and to utilize unwritten knowledge for efficient management. Participatory economic models can readily identify patterns through which society can be organized and directly engage in processes such as planning and investment. An example of these proposals is a model developed by Elinor Ostrom, in which grassroots and autonomous institutions are created due to their need for intervention, and everyone can change patterns of production and consumption through these institutions.[39]

All individuals can use the ticketing (requests) system to criticize, suggest improvements, and create changes in economic and political relations among other things. Requests should be categorized in a way that adequately represents the complexity of the economic and political system of society, and everyone can see these requests and respond to them if they can (and qualified to do so). We believe that only a networked mechanized system will be able to create a coherent infrastructure for such a mechanism, which was not possible in classical and neoclassical models. Individuals can evaluate the work of others through this system, express their opinions about the honesty and performance of organizations, provide suggestions for their improvement, or publish a call for mediation or judgment on a subject, person, or institution. The ticketing system also includes large discussion forums that, like grassroots parliaments, respond to the bureaucratic needs of society, and through them, not only employed or unemployed individuals can share their knowledge with others and engage with Unicorn, but economic and political institutions are required to communicate and conduct exchange with other

institutions through this system.

Individuals are virtually ranked in this system based on their efficiency in answering requests. If an individual or institution submits a proposal to this system that contributes to the improvement of a subject or makes an efficient decision about another request, they will be favored and ranked by other members. This ranking helps an secretariat algorithm to send tickets to the most efficient authorities and individuals in the future, who have a positive track record in responding to requests. In that way, having the minimum rank doesn't hurt an individual's life. It should be noted that the algorithm of this system and the secretariat are not predetermined algorithms, but are based on guidelines created and updated constantly in the system and according to the law. These guidelines are minimal and will not be rules for all system relations. The ticketing system must allow everyone - regardless of their role in the economic system - to express their opinions and suggestions about issues and participate in small and large decisions. This system can also be used as a mechanism for polling or referendum on major issues.

All tickets and responses to them - randomly or algorithmically based - are reviewed by other users. In some cases, the authority to respond to a ticket is only one department, in which case the request is sent to that department, and its result is evaluated randomly by other individuals. A machine learning algorithm can quickly learn the complex bureaucratic relationships that require a lot of time and resources in the current society and, with the help of an electronic secretariat embedded on Unicorn and government and non-governmental organizations, solve users' problems efficiently or refer them to relevant authorities. Therefore, entrepreneurs and researchers can fulfill their essential role in the regulation and decision-making process using this system. This system can also be used to register requests in various other areas such as company registration, civil registration and identification, and legal matters and judiciary.

This mechanism potentially responds to the problem of "discovery," which is a key point in the criticism of the Austrian school of market economies or planning. Here, the worker or consumer is no longer a passive element in the complex system of

supply and demand, but an aware agent whom society values their awareness and effective intervention.

Equal Income

One point here that most economists - especially market economists - would object to is the concept of equal income for all. Market proponents and other critics of socialism argue that equal rights for all workers in society eliminate the necessary motivation for participation in certain sectors altogether and, in the absence of income inequality and profit, society loses its economic incentives. This is also another criticism by Austrian School intellectuals.[40] Marx also imagined that since socialism rises from the ashes of capitalist society, perhaps workers might have to recognize differences in income at some point.[41]

Each individual in society has abilities that are qualitatively and quantitatively different from others. These differences can be broadly classified into two categories. One is the diversity of education levels, reflected in the level of skill of the workforce, and the other is personal qualities such as motivation to do hard work, individuals' ability to work in groups, and other such factors. Can socialism recognize the different quality of people's work in such a way that it imposes different incomes based on these variables

Marx explains in the section on commodity fetishism in Capital that consumer goods consist of different amounts of labor. In the commodity production method, the relationship between workers is only understood in the form of that commodity and only during exchange. When we equate the amount of labor performed in two commodities during exchange, we don't know why we do that. “The determination of the magnitude of value by labour time is therefore a secret, hidden under the apparent fluctuations in the relative values of commodities.”[42] In barter exchange and in an economy where everything, for example, is exchanged based on cotton, even producers measure the value of their work based on cotton (or gold). This seems irrational. Marx then refers to the example of Robinson Crusoe. Robinson's relationship with the objects around him is limited to their name, the type of work done on them, and

the time required to do this work. Marx says in the Middle Ages labor was calculated based on time, but the labor time of a servant was different from their master. In a patriarchal family today, there is no exchange inside the home. Different members of the family produce different products at different times, and "the measure of the expenditure of individual labour power by its duration, appears here by its very nature as a social character of their labour." Marx ultimately says in a free society where production tools are communal, we face the same world as Robinson, except that here work is not individual but social. "The social relations of the individual producers, with regard both to their labour and to its products, are in this case perfectly simple and intelligible, and that with regard not only to production but also to distribution."[43]

Therefore, an economy that can equalize its variables and base economic relations on them is an economy where the work done on goods is the average work done by various members of society as a "socially necessary" work. The different qualities of people's work, when extended to the whole society, crystallize into average work done on primary resources, and only in this way can it be measured. If the basis of labor calculation in society is the duration of that work, individuals contribute to the production of the commodity to the extent that they work on it. And just as an hour is an hour everywhere in the world by convention, in a closed economic system, the work done in an hour is also equal everywhere, and the work done in a month is the same.

There is a consensus among capitalist economists that the work of an individual, who has spent years studying and acquiring the necessary knowledge and skills to do a specific job, has a different content than someone who has never pursued a particular skill. This statement is true, but it applies to a society where the costs of education are borne by the worker herself and its proponents are only educated individuals, not a society where education and acquiring skills are basically provided free of charge. Second, does education really give value to the educated person that an illiterate person working in construction lacks? The answer to this question can be left to the democratic decision on the part of socialists for them to propose their society structure; however, education seems to have more qualitative and in many cases some advantages

compared to simple manual labor; and its cultural status in a capitalist society is higher than that of a non-skilled laborer. We believe these two types of work (and all other types of work) should be considered equal; but it is ultimately the society that must decide on this matter.

Regarding education, we believe socialism should provide equal and free educational opportunities at all levels for those interested in pursuing a profession and employment. Education should not only be free (which is currently the case in some capitalist countries) but students should also receive wages based on the hours they are engaged in studying. This is not an unusual practice in countries like Finland; as education is a kind of justified and socially necessary work. The output of a school or university is experienced work and should be given credit accordingly.

We all live in a society that has been under the dominance of capitalist mode of production and distribution for centuries. For many of us, the idea of a society where everyone receives equal rights by contributing equal amount of work is difficult or impossible to grasp. We do not know precisely what equality means, and the culture of reproducing inequality prevails not only in the general public's perception of the economy but also among economists. In the long term, equality in income will bring about radical changes in the cultural fabric of society and will change the supply and demand dynamics in ways that are initially unimaginable to us. Equal income (for equal hours of work) in the long run gives everyone the opportunity to prioritize personal interest as well as the benefit of their society in choosing their profession, rather than focusing on individual income. With the elimination of competition for income, ideologies such as sexism and racism, both of which are ultimately classified by Marxist analysis as attributing low value to the work of others for trivial reasons such as having different gender and race, would fade away, and different sections (with various identities) would look at each other's economic and social status in a unified way. We believe such a thing is possible. If the measure of success in society is not seizing others' wealth for personal gain, the quality of life for everyone will increase, crime will decrease, and everyone can benefit from a high level of income redistribution.

A direct response to bourgeois economists' criticism of socialism could be as follows: Suppose a socialism is established in which everyone has equal rights and income. Can it be imagined that for this reason, people lose their motivation to work and society no longer produces anything? We do not think so. Production relations in socialism undergo fundamental changes, and individuals will meet their needs in innovative ways. The elimination of profit confronts the capitalist mode of production with risk and shock, but a synthesis from the heart of this contradiction will demand a significant difference from the state we can imagine today. The motivation to profit and accumulate more money bears an essential difference from the motivation to fulfill one's own and others' needs, which capitalism has miraculously linked together. In the absence of profit, human needs do not disappear but will be met in a novel way.

Labor Shortage in Specific Sectors

In a capitalist market, labor shortage in a sector leads to an increase in wages in that sector. This wage increase manifests itself as rent. Rent arises because owners of scarce resources (in this case, labor) have a better chance of demanding more money for their resources in a competitive market.

In a centrally planned economy, there is sometimes a need to direct labor to specific sectors that require more focus. In the Soviet Union, economic plans aimed at the development of certain industries led to higher wages for workers who were interested in entering those sectors. This phenomenon is also common in today's competitive markets. Although these higher payments were common in the Soviet Union, they were unpopular policies, and the Khrushchev’s government was consequently forced to minimize income inequality. Brezhnev also continued this policy of wage harmonization. However, rent payments in capitalism are usually continuous, and high wages in these sectors are permanent and disproportionate to other sectors.

A socialist economy may also have a tendency to direct labor to specific sectors. Advertising and media can be used for this purpose,

but ultimately, by passing laws, rewards can be considered for workers entering these sectors on a monthly or quarterly basis. Such rent payments should not be permanent as they will be objected to by other workers.

Overview of Unicorn

Unicorn is a mechanized and open-source system similar but not limited to an online store. Producers register their output along with the raw materials and labor they need (inputs), and the system determines the total cost of goods and services based on the amount of work done for them.[44] Final consumers can also use this system like a conventional online store and choose the product they need from a vast catalog of basically all of society's products. Suppose you are a graphic designer working for a company. Your guild or workers' council will continuously record the hours you have worked on Unicorn (this can be done automatically using attendance devices). If you have worked 140 hours a month, you will automatically receive tokens equaling 140 hours from Fund 2. A portion of your monthly tokens is deducted as tax. This tax is deposited into other funds with various purposes. Depending on the amount of these withdrawals, you will have a net income that you can spend on the existing online market (or if you prefer, in your city's stores). Your credit is automatically deposited onto a plastic card, which you can use to pay for services in stores and service units. The tokens that replaces money in the capitalist society can only be used through this card and has no physical form. Everyone will be free to spend their credit as they wish. Each store has a card reader that deducts the cost of purchased goods or services from your account using this device and your card. The amount you pay will be directly deposited into Fund 1 so that auditors and economists can extract economic indicators by calculating its balance. Economic decisions at both macro and micro levels are made by councils and unions, and the government and the existing artificial intelligence system in the single branch only offer suggestions for supply and demand, regulation policies, and planning to these unions.

Variables, algorithms, and statistical data extracted from Unicorn are used in various sectors of the political structure of society. For example, algorithms for supply and demand that Unicorn prepares quantitatively and statistically can be used to regulate sectors of industry that do not have sufficient capacity or need more resources for more modern machinery. Planning in both macro and micro levels, using accurate statistics provided by Unicorn from tax payments and other macro variables, is finely tuned, and long-term plans will be able to be drawn in a way that no market system has precedent for.

With the general definition of the basic functions of Unicorn, we review the main mechanisms of the system available to individuals as follows:

1. Profile of factories and companies, which a member of these units would be democratically responsible for maintaining. In this profile, the economic unit's information and details of the services or goods offered by these units are recorded and reviewed by volunteers and relevant departments for accuracy. The inputs of companies, such as the number of required working hours weekly or monthly and all necessary items with their details, are registered on this profile. Units can edit their offered services on this profile and, if necessary, add or remove intermediate goods, services, and specifications of their output products. Using user profiles for companies provides a much simpler and advanced system for ordering goods and accounting compared to current methods available to companies.

2. User profile for consumers, available to all members of society. Individuals register themselves on Unicorn and verify their identity electronically or by visiting civil registration offices to access the services offered on the system. People can buy their goods on the market or offer services to others on this marketplace. Users' available tokens and the amount of taxes, expenses, fines, and other deductions are visible in this profile. Each user's token balance is directly linked to a plastic card similar to a common credit card in today's world, and individuals can purchase goods and services they need in local markets and stores with this card without having to use Unicorn’s electronic marketplace. This card could also serve as individuals' identity card.

3. Profiles related to administrators, unions, banks, and other institutions that facilitate matters between production and consumption according to society's approved criteria.

4. Requests: A ticketing mechanism on Unicorn allows all system members to send requests to administrations, organizations, and economic and political units. This mechanism enables everyone to directly participate in the political and economic processes of society. Individuals can create any requests they believe another person in society can respond to, and others can refer these requests to relevant units or respond to them themselves. A virtual secretariat will facilitate the effective response and guidance of these requests. Proposals for creating new businesses or closing existing ones, restoring public buildings, and improving municipal services are some of the actions that will be possible for everyone through creating these tickets.

Macro Planning and Budgeting

In the macroeconomics realm, the aim is to create a general balance in the economy regarding the consumption of social product. Macro planning ensures that various components of production and consumption are uniform and balanced. For such work, we need an accounting framework. Three main factors in macroeconomics, including theory, legislative goals, and accounting, are interdependent. A precise and reliable accounting framework is a necessary condition for sound policymaking.

Our economic plan is based on labor time as the unit of social calculation. In this chapter, we address the general content of macro accounting from this perspective and simultaneously discuss policies tailored to this type of accounting. We will then address more specific questions.

Macro Calculations Based on Labor Time

In the socialist economy we have discussed so far, the total gross output is based on the labor content of all goods and services produced and consumed in a specific period - for example, one year. Gross output is divided into two main parts depending on the source. The major part of it is the current labor input (i.e. all labor performed in a specific time), which we call *current labor*.

The other part is the labor embodied in past production and is transferred from such goods or services. This part may include productions that were produced and stored in the previous period but are consumed in the current period, or productive tools that gradually wear out (such as machinery, structures, and tools). We call this transfer of value from labor related to the previous period *depreciation*. With this description, we can write the first general accounting equation as follows:

Gross Production of Value = Depreciation + Current labor (4-1)

Thus, net output can be considered as the amount of goods and services that are produced exceeding the amount needed for the complete consumption of previous labor products (depreciation). Therefore, in formula 4-2 we will have:

Net Production of Value = Depreciation - Current labor (4-2)

The principle of distribution in our system is such that workers receive tokens based on the number of hours worked (1 hour of work = 1 token). Therefore, the total tokens produced (during the accounting year) are equal to the total hours worked. If the tokens of current labor are equal to the number of tokens exported for working hours, we reach formula 4-3:

Current labor tokens = Current labor (4-3)

From formulas 4-1 and 4-3, it follows:

Current labor tokens = Net Production of Value (4-4)

Suppose workers use their current tokens to purchase consumer goods. Also, the value of goods and services in our system is actually the same labor content (all hours worked on them). With this account, if individuals spend all their tokens, it means that the total net output or total net product has been consumed.

Considering the above equations, if individuals spend all their tokens, then their income will be less due to the existence of depreciation in gross output. In this way, it can be ensured that the products produced in the previous period are fully consumed. However, there are two other reasons for which the complete consumption of net product is not possible.

The primary reason is that social product has other important uses that are not consumed individually. Uses such as health and education (social provisions), net accumulation of produced goods spent on improving production capacity, and potential loans given to other economic systems. By naming these three sources as *social*, *accumulation*, and *trade*, and defining *consumption* as personal consumption, we will be able to create an account for them in our

calculations:

Net Production of Value = Trade + Accumulation + Social + Consumption (4-5)

The latter formula reduces the net product produced to four items of the initial uses that constitute it. Therefore, if any investment (resource allocation) is made in the social sector, the consumption portion will be smaller than the net production. In this case, it is concluded from formula 4-5 that consumption will be less than the available consumable tokens. One solution to this problem is to tax workers' income in the form of consumable tokens. It is not necessary to reduce the entire difference between the current consumable tokens and the allocated consumption quota in our plan in the form of taxes, as workers may save some of their tokens instead of consuming them. Saved tokens "free up" resources other than consumable resources in society. We will address this issue later.

The second reason why individuals are unable to consume the entire net product available in society or, in other words, all their work tokens is that a portion of this product must be allocated to non-working individuals. Unemployed individuals, the retired, disabled individuals, and those seeking employment should be able to receive a stipend from society. If purchasing goods and services in society is only possible using these tokens, then some of these tokens must be allocated to these individuals in the budget plan. This amount of tokens must be deducted from producers of value (through taxation) and given to non-working individuals because otherwise, and if this amount of tokens is "printed" without such calculation, it can have inflationary effects on the economy.

We define the amount of value that needs to be transferred to unemployed individuals in a new account called the *transfers* account. The primary source of a household's budget is work tokens. Additionally, as mentioned, households can use transferred tokens (transfers) for consumption. Consumers can allocate their budget in three ways: they can deposit it as taxes into the government fund, they can spend it on their consumption needs, or

they can save the net amount of it. With this account, the budget income and expenditure formula becomes as follows:

Transfers + Current Tokens = Savings + Consumption + Taxes (4-6)

The above formula is the general formula for household consumption. Now let's focus on the government fund. The primary source of government income (or fund number 2) is taxes. Additionally, the government, in the form of a "financial institution," receives tokens that individuals save. The government takes these two sources of income and spends them on transferring tokens to unemployed individuals, social provisions, accumulation, and trade:

Savings + Taxes = Trade + Accumulation + Social + Transfers (4-7)

The last two equations can be rearranged in different forms. Here, we combine taxes and transfer tokens to extract the concept of "net taxes." Net taxes here are total taxes minus transfer tokens. This net tax is essentially net income (based on work tokens) that the government has to allocate to sectors other than *consumption*.

Therefore, the two above formulas are rewritten as follows:

Net Taxes - Total Current Tokens = Savings + Consumption (4-8)

Savings + Net Taxes = Trade + Accumulation + Social (4-9)

If we add the two above formulas together, savings and net taxes cancel each other out, and the general formula below is formed:

Total Current Tokens = Trade + Accumulation + Social + Consumption (4-10)

Considering that the total amount of current tokens equals net

product, we again come back to formula 4-5, indicating the consistency of our computational method.

Let's examine the above formulas once again. Each household uses tokens it possesses to purchase consumer products. The government allocates one token to individuals for every hour of work they do in society. Unicorn is the employer of the entire society and manages all the goods in society on behalf of it. Suppose decision-making entities (including unions and councils) decide to build a hospital. In order to do this, Unicorn is obligated to pay tokens for every hour of work (directly or indirectly) used for building this hospital; however, it does not need to provide the necessary raw materials for the hospital construction. Also, Unicorn system will never run out of tokens because tokens are essentially credits related to ledger accounts issued in the name of workers.

Nevertheless, the macro accounts must balance. The amount of issued tokens must somehow meet the demand so that the value of these tokens does not plummet. For this reason, the government must deduct some of these tokens from households' consumption credits. Suppose the macroeconomic program is based on allocating 55% of net production to consumer goods. Also, assume that workers do not save any of their tokens and spend them all. In this case, the remaining 45% of the issued tokens must be obtained through net taxes from workers to be used for projects such as social security and other expenditures. Otherwise, due to the existence of surplus tokens exceeding the necessary social work for producing goods and services, the value of these tokens decreases, and we face the tokens inflation. This situation may also lead to long queues for purchasing products or shortages of consumer goods. If the net taxes collected exceed the necessary amount, the available tokens for consumption will be less than the social work value of the products, leading to surplus production or recessionary effects on these tokens.

The above explanations were made assuming no savings by consumers. If workers or consumers save some of their income or borrow tokens, the calculation of taxes will be slightly more complicated. Below, we will address these two issues.

Household Savings or Loans

Savings can have various reasons. If individuals do not have sufficient income, they may want to save for large household expenses (such as buying a car or going to vacation in another country); however, individuals with sufficient income will not save for these reasons. Some are future-oriented and save for a day when they can no longer work. Others save for a better future for their children.

Another important reason for savings is to create security against potential crises. Natural disasters, unemployment, illness, and premature death are among reasons that compel some to save their assets. Also, in unhealthy economies, individuals are actually unable to spend all their income because, for example, the goods they need are not available in society or their lives are low-cost anyway.

A socialist system will likely address many of the above needs and significantly reduce the motivation for savings. Free education at all levels, the elimination of land ownership, and income equality for all individuals will reduce the need for savings. Adequate retirement benefits, insurance, and free healthcare services will also improve the welfare level of the society compared to the best of capitalist welfare states.

A precise planning focused on growth, full employment, and support for the unemployed reduces the need for savings to a reasonable extent, and in this case, consumers will have more motivation to spend all their tokens.

Now let's discuss the issue of loans. Some individuals, for various reasons, prefer to borrow credits instead of saving to increase their purchasing power. In current societies, this is meaningful for young people who expect their income to increase in the future. Apart from short-term borrowing, obtaining long-term credit from financial institutions is mainly due to the need to buy a house. Besides these reasons, in countries like the United States, individuals are constantly encouraged to use credit cards and receive loans that are not always reasonably justified. All of these cases lose their meaning in socialism.

Although socialism could have practical solutions for the above cases, the complete disappearance of savings and borrowing by individuals seems unlikely. One important reason for saving and borrowing is that consumers want to benefit from their consumption pattern when their monthly or annual income does not allow it. With savings, an individual can increase their future purchasing power, and with borrowing, they can increase their current purchasing power. However, savings in our societies are self-contradictory and uncertain. No one (even economists) knows how exactly the value of money will alter in ten years. If the value of money decreases in the future, saving loses its justification even more.

Nevertheless, savings can be seen as an opportunity in a planned socialist economy. Today's savings can contribute to future income circulation and economic growth. When individuals save, they abandon part of their will to consume society's products, thus "freeing up" resources that can be used for production. In a capitalist economy, there is a risk that these freed resources will not be properly utilized and will remain "idle." In favorable conditions in a capitalist economy, saving induces production units to invest in a way that future production will be more profitable (Keynes believed this to be very unreliable[45]). Therefore, increasing savings leads to a reduction in overall demand for produced goods and services and results in a recession.

Consumer savings reduce today's production capacity and can lead to increased production capacity in the future. In a planned economy, the opportunity created by the release of resources can be used for investment in future production. In the economy we are considering, the determination of the accumulation rate is done democratically. Planners decide to increase the accumulation rate and investment in sectors that will create value in the future when the number of unemployed recipients of welfare is increasing. It is clear that such a decision limits the supply of goods and services today and reduces current consumption.

With these features, how can a balance be struck between personal decisions of this kind and an effective program in which such decisions are not harmful? Here are a few suggestions in this

regard:

1. Consumers can be given the opportunity to deposit their tokens into retirement funds of their choice (designed to pay benefits in the future). These retirement funds will be directly linked to Unicorn so that planners can examine the volume of resources using their data.
1. Excessive savings, which harm the economy, can be limited by setting an expiration date for tokens. Unicorn can allow consumers to use their oldest tokens for purchases so that individuals do not lose any tokens for no reason.
1. Individuals can save their income in financial institutions and banks. If the savings rate is higher than the withdrawal rate, the balances in these funds can be used to provide loans to consumers. The use of these funds can be under various conditions, but overall, since they contribute both to savings and to lending credit, such measure would not harm the overall economic plan.

Taking the above points into account, the formula of the budget flow can be rewritten. As we explained, households spend their tokens and savings some which can be considered as a source of income for the budget. First, let's address the concept of gross savings. Gross savings mean the total tokens that individuals save in retirement funds (*retirement savings*) plus the total tokens saved in financial institutions (*bank savings*). To calculate *net savings*, the benefits obtained by individuals from investing in retirement funds (*retirement benefits*), their withdrawals from the savings fund (*savings withdrawals*), and the amount of new credits provided by institutions to individuals (*new credits*) should be subtracted from gross savings. The equation would be as follows:

Net Savings = Bank savings + Retirement Savings - New Credits - Savings Withdrawals - Retirement Benefits (4-11)

By putting the relevant terms for bank savings together and the relevant terms for retirement funds next to each other, the equation can be rewritten as follows:

Net Savings = (Retirement Benefits - Retirement Savings) +

(Bank Savings - Savings Withdrawals - New Credits) (4-12)

Let's focus on the savings and credits section in the above formula. Note that the second part of the formula (bank savings minus savings withdrawals minus new credits) is considered a net income source for the budget. This is the net amount that society members save in financial institutions, and the government can use it for investment. We previously mentioned that if the amount of credits (loans) paid to individuals equals the total savings of society, the second part of the formula can be considered zero. This can be achieved through laws related to loan and credit criteria.

Now consider a scenario where the society tends to save more and does not need to receive credits. In this case, the resources obtained from savings can be redistributed by providing credits to consumers. However, such a policy is not always desirable because the government can use the net savings of the entire society for development purposes.

An important issue here is that while individual savings and the credits paid to them are liquid, the productive assets created using these funds are not. Since savings represent the cash individuals use for investment in sectors that require time for development, the government may need to issue additional tokens to meet some payments. This can have an inflationary effect and affect our calculations.

Keynes addressed the issue according to which individuals' savings are liquid, but the assets resulting from these savings are illiquid. In a centralized system, the government can prevent the rapid liquidation of savings invested in various sectors by their owners. The government can introduce conditions for withdrawals from savings accounts instead of producing extra tokens for this purpose.

Savings Interest

Should individuals' savings in society earn interest? Let's assume that savings interest in society is zero. In that case, individuals would be able to withdraw exactly the same amount of tokens they

have saved from their savings accounts. It is worth noting that as the productive capacity of labor increases over time, the content of goods in society decreases, and as a result, the value of tokens increases. This increased value can be apportioned on long-term savings that themselves lead to an increase in labor productivity, because, as mentioned before, non-consumption frees up resources that can be used to enhance the means of production.

However, as mentioned earlier, determining the limits of using resources provided by savings and determining the interest for these resources is a secondary issue for our desired economy. In our overall plan, the taxes democratically imposed on consumption tokens provide a general and fundamental estimate of the limits of accumulation of the means of production and development, and the resources provided by savings can only account for a small part of this accumulation.

Tax System

Regardless of how the economy can benefit from savings and loans, taxes play a major role in balancing macroeconomic planning. How does tax provide the budget plan with the required resources?

The issue of budget and public spending are among the most important topics to consider in macroeconomic planning. The main source of government budgets is taxes, levies, and miscellaneous revenues, including fines, etc. The budget expenses can generally be categorized as follows:

-Public services

-Sciences, education, research, and cultural affairs

-Social security, family, and labor market

-Health, environment, and sports

-Real estate, urban and rural development, regional planning

-Food, agriculture, and forestry

-Water and energy management and trade

-Transportation and communications

-Financial management

In the former Soviet economies and many capitalist countries, the main source of budget financing is income tax or profit tax. In these systems, the selling price of goods differs from their total cost. The difference is deposited into the government's account and used for the purposes defined in the budget plan. This approach contradicts our assumptions. In our proposed system, consumers spend exactly the same amount of value to purchase goods as is spent on their production, and there is no difference between the purchase price, selling price, and production cost. Therefore, our general preference is to impose income taxes.

Social-democratic countries impose income taxes progressively with the aim of increasing the general welfare level; therefore, in these countries, as income increases, so does the tax. However, this policy has not yet led to the elimination of income inequality in any country. In a socialist system where everyone has equal income based on their working hours, the fairest policy is to impose a fixed income tax (a percentage of income) for all employed individuals.

A fixed income tax means that employed individuals pay a portion of their daily work to produce value for the entire society, and everyone must contribute with a minimum of daily hours of work. Taxes can be a percentage of each working hour or a percentage of the tokens earned from part-time and full-time work.

Land Rent

In capitalist systems, trade involving private and public lands lead to income disparities and create significant class divisions. Individuals and legal entities can cause an inflationary effect on the prices of goods such as food and consequently other items through Land Grabbing and purchasing low-priced lands for future sale (Speculation). In a recent example, China has engaged in land speculation by purchasing large amounts of land in Ukraine (equivalent to one-fourth of the total cultivable land in Germany)[46], meaning it is buying lands based on predictions that it will become expensive in the future. Such actions are highly irrational and

unethical even for the global capitalist economy, and some governments are trying to counteract them through legislation. But what is ethical for capitalism? Capitalism is present wherever there is the slightest possibility of a greater profit, regardless of the consequences of such investments.

In our proposed socialist system, land ownership is entirely abolished, and all lands (regardless of their use) become public property. However, individuals can purchase existing residential structures on the lands or engage in the construction of personal properties on the land. Individuals living in residential properties built on the land could be asked to pay rent to the government for the use of the land. This rent should be fair and dependent on local factors, including land area. A person living in a personal property (whether owned by themselves or others) should pay minimal rent for land use. The sale of residential properties to others may only be possible by calculating the total work done on these properties and considering the depreciation of structures; therefore, the exchange value of residential property sold to others is always less than its construction cost. These calculations are made based on data recorded on Unicorn and are closely monitored by supervisory bodies. In this case, making profits through buying and selling residential properties will be impossible.

Resource allocation in the housing construction and renovation sector is done by Unicorn with the approval of local councils. Investment and construction of properties can be done by individuals or Unicorn. Properties whose investment and construction are carried out by Unicorn should be considered public, and residents only pay land rent. Thus, there is a residential real estate market on Unicorn where citizens can search for their desired residential property and become either owners or tenants of a property. The new owner pays for the depreciated construction costs of the property and the facilities in it along with the land rent to the public fund (Fund 1), and as mentioned, the tenant only pays land rent. All these matters are licensed by local councils, and the rent is deposited monthly or annually into Fund 1.

Non-residential properties such as fruit gardens, agricultural lands and industrial properties, being part of the means of production, are not for sale and are allocated by programs in which

councils and unions have a role in regulation. Companies pay rents for land use based on contracts, and taxes, penalties, and customs are imposed to prevent violations, encourage export against import, and other purposes according to law.

Strategic Planning

In strategic planning, we address issues that are not considered in macro and micro planning and are largely related to the specific structure of a socialist economy. With the elimination of profit-based competition from the economy and income equality for all, the foundation of social relations undergoes significant changes, and social division of labor adopts new trends. With the means of production being shared, no minority owns the society's productions, and everyone can benefit from the society's productions to the extent they participate in society. The advancement of the production sector and other service sectors is not assessed based on profitability but rather planned to meet the needs of society. The main goal of socialism here is no longer growth but rather the provision of people's needs. Growth would be a secondary policy and only receives attention when there is consensus among the public regarding it.

A very important point to consider here is that in a socialist system where economic calculations are centralized, the major risk is that workers may no longer be able to make decisions for their economic unit or the country as a whole, and the central management is entrusted to a "privileged" minority that has no direct role in creating value. This event, which also occurred in Soviet Russia, contradicts the basic principles of socialism. The reason for our use of a centralized system is to improve the overall efficiency of the economic system, but this should not lead to the creation of new economic classes or political factions that exploit workers in new ways. Therefore, our centralized system should be decentralized in a way that allows workers to democratically determine the dimensions of their economic participation and modify them if necessary. We will delve further into this topic in chapter 7. However, as far as socialist strategic planning is concerned, this plan should prioritize workers' decisions and propose economic plans designed by them to councils where the

only limiting factors are the workers' will, the inconsistency of their plans with environmental conditions, or the inconsistency of these plans with macro plans and laws and regulations previously approved by labor unions and supreme councils. We will not delve further into this matter here.

The strategic plans should prioritize answering the question of what portion of production should be allocated to industry and development and what portion should be allocated to free services provided to the public. Investment in the industrial sector is a key topic for us. What, how much, by whom, with what facilities, and where should production take place? Resource allocation here is done after completing the data tables discussed in chapter 2, determining the focus on various sectors.

For a socialist economy that is based on returning control of the means of production to those who use them, the process of production undergoes fundamental restructuring to ensure that producers can benefit from the community's resources in a guaranteed manner, leading to a peaceful and fulfilling life. Maximizing labor to create maximum economic resources under certain conditions (such as war) may have a special temporal meaning, but it probably does not become a principle that various segments of a socialist society believe in.

The basis of sharing interests in various societies under a socialist mode of production changes so that everyone wants to be involved in the process of sharing and participating. Socialism in its initial stage should effectively eliminate or step towards eliminating classes. Class - contrary to the perception of many sociologists and modern political scientists - is not a quantitative measure of wealth or poverty of individuals but rather, in the field of critique on capitalism, it is a binary measure: Some individuals in the society own the means of production and exploit the rest of society. Those who do not own means of production other than their labor are brought into a new form of exploitation by capitalists and their theorists. They plan in a way that no minority position has the right to interfere from above in any economic process. Any policy other than this is clearly non-socialist. The initial program of a revolutionary party aimed at confiscating legal ownership of capital and entrusting it to the working class can prepare the ground for

the dominance of a socialist mode of production so that the society can consequently have a well-thought-out plan for a radical change with ready-made algorithms to return the stolen portion of labor to the workers, eliminate economic surplus including surplus capital, and empower decision-making and planning to labor unions and consumers.

We do not believe that competitive markets or even socialist models of the market can solve the fundamental problems we see in the world today. Imbalanced growth, arms sales to countries involved in internal and international conflicts, and global inflation are just a few examples of the results of policies created due to the profit motive in the world. Macro planning in a capitalist system is directed partly towards creating mechanisms that prevent full employment, because in a self-stirring market system, full employment leads to inflation. Militarism, different kinds of discrimination and class disparities, and imbalance in the general policies of the capitalist system are among the main reasons for our defence of a socialist alternative. However, theoretical alternatives to socialism generally consider a radical solution to these problems impossible, to the point that John Roemer, a socialist theorist, defines market socialism in a famous article entitled "A Future for Socialism" as follows:

> “By market socialism, I shall mean any of a variety of economic arrangements in which *most goods*, including *labor*, are distributed through the price system and the profits of firms, perhaps managed by workers or not, are distributed *quite* equally among the population. By what mechanism profits can be so distributed, without unacceptable costs in efficiency, is the central question.”[47] *Italics* are from us.

In most "socialist" market-based models, ownership of the means of production remains in the hands of the owners of capital, and the market continues the same structure and logic as in the capitalist system, with equality defined in a way that allows capitalists to first make their profits and after that, the topic of equality will be discussed over the remaining of the wealth. Although in the past years, there are more discussions on planned socialist economies, according to the most academics, apparently no other socialist

economic method is possible. Roemer, one of the prominent contemporary theorists of market socialism, says in the same article: “I believe that socialists have made a fetish of public ownership: public ownership has been viewed as the sine qua non of socialism, which is based on a false inference.”

This is interesting. Not only socialist workers but also generations that come after them are forced to always work under a system based on wage slavery, because people like Mr. Roemer fear market shocks and consider a radical change in the economic system impossible. This is the same experience that engulfed the Soviet Union and China. Planning systems in these countries could not prevent the economic cartel leaders from greed and accumulation of surplus value for themselves, and for this purpose, they had no solution other than imposing coercive policies or reconstructing society based on principles such as cultural revolution. In the model we are introducing, the design of the economic system is such that no one can systematically accumulate capital, planning is done democratically, and there is no need for coercive policies to control the economy.

Another important point to consider is that economic relations in global north differ from those in the global south. While the main problem in many northern countries is surplus production and redistribution of value, production is still facing deficits in many countries in global south. The Supreme Council for Strategic Planning must be able to solve the problems facing production and, in the case of surplus production, manage and redistribute it optimally or eliminate it completely. A centralized planning system has the capability to do such work.

The content of this chapter can be the subject of discussion for political groups and is not to be generalized for any political economic system. The unique characteristics of different regions and their access to various natural resources and social relations undermine the basis of predicting a strategic plan that can be implemented everywhere. In this chapter, we only briefly refer to the general coordinates of such a plan to demonstrate what features it could have. In subsequent chapters, we will address who the decision-making authorities or organs are in a democratic socialism and what their structural principles are.

Planning for Industrial Structure

In a country with less dependence on imports compared to other countries and a relatively dynamic industry, planning in the industrial sector is of great importance. Russian and Chinese socialism, with all their strengths and weaknesses, have been able to nationalize parts of their industries, including heavy industries, and focus on them - which in the case of the Soviet Union meant lack of focus on and even sometimes neglecting other sectors - leading to their flourishing.

One issue that is important to us here is the optimal use of technology and increasing labor productivity. Policies that lead to overall greater productivity are adopted in a democratic manner and approved by various councils, and resources are allocated accordingly. Emphasis on improving tourism or industry infrastructure can lead to economic prosperity in these sectors. The integrated request system embedded in Unicorn connects a systematic network of councils and consumers to each other, allowing everyone to share their knowledge. Decision-making about these requests is somewhat horizontal, but this cannot be the only level of decision-making in our intended system. High-level planning committees explicitly work on formulating medium and long-term plans to see the long-term effects of these decisions on society and predict their economic indicators. However, predicting which industries and technologies will be sufficiently productive and justifying investment in them for a long-term period of 15 or 20 years is a complex matter and requires expertise; however, it is by no means beyond the capabilities of the specialized committees of the unions. The composition of the committees that approve long-term plans should be different from the committees responsible for formulating short-term plans. Extracting the necessary data from Unicorn for the use of drawing these plans is one of the unique features of Unicorn that data scientists can fully benefit from. Another unique feature that is not possible in capitalism due to the lack of transparency.

The decision on which part of the industry needs more

investment and which part or parts of it should be completely phased out depends on the decisions of the Supreme Planning Councils appointed by the unions, and we will discuss their overall function in Chapter 7. Here, we only suffice to mention this example: When demand for the products of an industrial unit is low or its social costs are higher than reasonable, the decision to close these units directly contradicts the will of the workers employed in those units. Therefore, planning councils must use legal infrastructure and special guidelines for industrial management that enable them to exert full and democratic influence.

A significant strategic program for the industry can focus on exports and producing export items to meet the foreign exchange requirements for imports. This is a major topic that can be addressed through the formulation of long-term plans.

Considerations Related to Natural Resources

The logic of capitalism is structurally at odds with human well-being. The excessive extraction of non-renewable resources for greater profit deprives future generations of human beings of livelihood or a standard of living. The Paris Agreement introduced in 2015 sought to draw global attention once again to the risks of fossil fuel use and greenhouse gas emissions, imposing limitations on governments to prevent environmental destruction. However, many of the societies that have signed this agreement continue to ignore it in practice, and many countries have not even signed it. The United States did not sign this agreement solely on the pretext of a word that was in the text of the treaty.[48]

This does not mean that socialism in and of itself protects the long-term interests of humanity from reckless exploitation of these resources. Limited use of natural resources means reducing production in certain industrial sectors and requires a commitment beyond short-term planning. Dan Lavoie demonstrated, based on a critique raised by Von Mises, that calculating the costs of non-renewable natural resources using the labor theory of value is an insufficient approach to protecting these resources.[49] His argument was that calculating costs using the labor content of goods cannot

determine the value of raw materials and inputs on which no labor has been performed, and the cost of using these inputs in such systems is zero. This is while in the market, everything, even raw materials, has a price tag that is taken into account in calculations. According to this claim, in the labor theory of value, the final costs of goods do not consider the scarcity of raw materials and are always lower than they should be.

This issue is very important; however, this critique actually applies to competitive systems as well. Rational management of natural resources is the weakest feature of capitalism and the strength of socialism. In capitalism, pricing for non-renewable resources such as oil is unrealistic and dependent on market demand. This price mostly reflects the work done on it and the related profits, and if non-renewability of these resources is to be reflected in the price, the cost of many items will be beyond the purchasing power of the general public. If resources such as agricultural land are not regulated and the primary goal is only to extract products from them, these resources will gradually disappear. In capitalist and Soviet systems, sometimes rents were introduced for the use of these resources, which for various reasons could not effectively protect them. No economic system or decision-making mechanism that is solely based on one goal is capable of efficiently managing these resources. Regulation based on price data, because price does not include the ecological and environmental consequences of decisions, will be inefficient; because these consequences are complex and cannot be reduced to accounting and input-output calculations. Any non-qualitative assessment of environmental impacts is misleading, and the only way to regulate the use of non-renewable resources is to use the latest scientific achievements and political struggle to restrict their use.[50]

However, planners, with consensus, can determine virtual labor content for raw and natural resources through a strategic program to prevent their reckless use, and by recording these values in standardized data tables, prevent their reckless use, and replace products that are not environmentally compatible with similar products.

Production in the Agricultural Sector

Agriculture and animal husbandry, from Iran to Japan and the United States, are under the strictest regulations and are the focus of the most strategic decisions, and the idea of "free market" does not apply to them anywhere. However, countries of the “real-existing socialism” camp are notorious for their planning in agriculture. Russia, once a grain exporter during the Tsarist regime, became an importer of this product from the West during the rule of the Communist Party, and its farmers were among the poorest segments of society, with the parts of the country sinking into extreme famine. At the same time, China was able to increase the output of this sector by over 50% after the reforms of 1978, increasing payments to farmers and giving them more freedom to manage their cooperatives.[51]

Opponents of socialism believe that the elimination of private land ownership was the main reason for the problems in the socialist camp in eastern Europe. Before the collapse of the Eastern Bloc, in Poland, private agriculture and in its neighboring country, the Czechia, cooperative agriculture and animal husbandry were the dominant parts of production in this sector. However, in Poland, meat shops were usually empty of products, while in the Czechia, shops were full of meat products. Therefore, it seems that success in this sector is not necessarily related to the level of land ownership, and a complex array of factors including pricing policies, subsidies, distribution systems, and the cultural level of farmers play a major role in regulating the agricultural sector.

Today, given the absolute importance of agriculture, the main strategic policy of most capitalist countries is to encourage production beyond consumption and create a surplus in agricultural production. In most of these countries, there is so much surplus production that in some areas, vast unused potato fields are stored and demolished due to lack of demand. With this in mind, by examining the nutrition statistics and standards in various countries, the effectiveness of planning in these countries can be measured to some extent. Given that nutrition is the most important

human need, planning in this sector is of utmost importance.

Long-term contracts with other countries for importing necessary products in the agricultural sector can be one solution to the shortage in this sector. Also, since agriculture and animal husbandry are activities that sometimes require more than 8 hours of work per day, farmers should have the opportunity to calculate their actual work on the land through other means to have more motivation for production. They should have the opportunity to produce not only the output required by the program but also the products they and their small communities need without calculating the harvest and consumption in Unicorn. Strategic planning should also give farmers more opportunities to experiment with new methods of production and increase land and livestock productivity in comparison with traditional socialist models.

Modernization and Support for Entrepreneurship

Social relations in socialism must have the opportunity to find their own paths and simplify living conditions for the public. This can only be achieved through supporting new ideas and providing the necessary resources to modernize the industry. Startups and entrepreneurs must have the opportunity to present their plans to specific bodies tasked with comparing these plans with existing guidelines and supporting them if possible. Trial and error will be an essential part of the dialectic of economic and social relations, and if decision-makers cannot give newcomers the opportunity for trial and error for any reason, social life will become dry, where individuals cannot fully realize their agency in society.

Unlike western countries, China has a strategic plan to support experimental projects. Instead of short-term populist plans that have better returns for short-term governments and their electoral campaigns, China has long-term plans based on trial and error and creating special economic zones to support entrepreneurs working in digital technologies. Startups in China today are treated in a special way by the government. In this Chinese tradition, trial and error takes precedence over regulation.[52]

Furthermore, a new socialist society can attract the work of

foreigners who want to live in a socialist system. Opening borders to socialist labor, supporting political and economic refugees, and supporting integration policies are three important proposed programs to provide labor for entrepreneurs. Socialism, unlike capitalism, is a system where full employment can be achieved, and at the same time, by integrating foreign labor into production, it can support the process of enhancing the means of production and changing social relations towards a better socialism.

Other topics that can be discussed in strategic planning include:

- Urban and rural infrastructure development
- Feedback from consumers and public participation
- Redistribution of accumulated surplus
- Improving overall living standards and cultural equality, and taking steps to remove remainders of labor, race, gender and ethnically-based discriminations by continuously involving producers and consumers directly in defining laws and social relations dedicated to their groups
- Improving the quality of consumer goods and public services; reducing planned working hours and increasing job benefits and leisure opportunities
- Ensuring a minimum income for non-workers and individuals who are temporarily or permanently unable to work due to physical or mental weaknesses
- Determining a sustainable development outlook based on imposing necessary constraints on the use of natural resources
- Homogeneous regional development
- Ensuring free public services including education, health, public transportation, and utilities

Microeconomic Planning

Imagine your math teacher writes a number on the board and asks you to tell all the numbers it is the product of. This task is impossible because any number can be the result of a combination of many pairs, and simply having the final number does not indicate what combination it came from.

Prices in the market result from an infinite combination of factors that manifest themselves in a single final number. With this number, one cannot say which forces were involved in determining it, what decisions were made to increase or decrease it, and what mental and material motivations led to its formation. Therefore, since there are numerous hands at play in the market, and each hand operates with a complex mentality, and all these factors ultimately manifest themselves in the form of a single number, our understanding of the market mechanism is necessarily incomprehensible and incomplete, and it can never grasp the complexity of its nature. Although decisions in economic units are informed, it cannot be said that the overall market process evolves consciously or rationally, or that it can be understood concretely. Therefore, market regulation and reaching the equilibrium point of supply and demand always occur after the occurrence of imbalance events, and market problems can only be assessed and resolved after they occur.[53]

In contrast, conscious planning allows us to coordinate decisions before allocating resources. Although the debate over socialist planning is a highly controversial issue among economic theorists, setting production indices is currently - without exception - done in all countries of the world by the smallest economic units to the government and market regulatory bodies; however, many economists believe that any form of planning entails changing market conditions from above and that we should allow the invisible hand of the market to correct itself. This claim necessarily means that the market can increase public welfare by increasing its

efficiency in achieving higher profits and regulating supply and demand based on this principle. These economists generally deny the whole concept of planning, knowing that a society without efficient planning will face many crises. Rampant inflation, widespread unemployment crises, and environmental disasters are just some of the consequences of automatic market regulation.

While mainstream economists believe that planning should be done by large and small companies with the aim of reducing production costs and increasing profits, Dobb had given a breakthrough response to these claims in 1933. He believed that economic planning as a prediction of the management of interdependent investments, is a distinctive feature of the socialist economy and incompatible with private ownership.[54]

The main indicators of economic planning are largely the result of the political decisions of the owners of the means of production. When workers gain control of the means of production, they themselves must approve these policies in their institutions. Albert and Hahnel say in participatory economics:

> "why cannot workers in different enterprises and industries, and consumers in different neighbourhoods and regions, coordinate their joint endeavours themselves—consciously, democratically, and efficiently?… What is impossible about a social, iterative, planning procedure in which workers and consumers propose and revise their own activities in light of accurate information about what is efficient and what is fair?"[55]

In chapters 2 and 3, we claimed that central planning has the unique ability to potentially utilize vast amounts of input and output data from all production units to devise the best plan. Workers will be able to directly plan not only for their own unit but also for the entire economy through their own institutions through a political framework suggested in a brief manner in chapter 7. Using an algorithm that we will delve into later, the central planner will provide recommendations to labor unions for adjusting production volume or the flow of production tools for optimal use. Here, we will address how the foundation of this planning will be.

As demonstrated in chapter 2, planners and workers can determine the precise amount of output that should be produced by

utilizing input-output tables (datasets) through having the initial resource quantities and required workforce. Additionally, using these tables, they can determine the amounts of intermediate products that each unit must produce for other units, but this is only a theoretical model for determining intermediate and net outputs of industries and companies. In the real world, achieving this is fraught with difficulties, the most important of which is resource constraints. For example, planners may realize that to achieve the desired output for a set of units, they require x kilowatt-hours of electricity, but the current electricity production capacity is less than this amount. Moreover, the plan may require more output from a unit where there is insufficient labor force, while in another sector with less priority, there may be an excess of labor. Planning committees must have policies that can address this disparity in labor concentration and resource constraints.

The required output from some production units may be less than their capacity. That is, with the resources at their disposal, these units can expect higher output than the proposed output by the plan. However, higher output may not be desirable for this unit because there may not be sufficient demand for it, and producing more in that unit may simply result in wasted resources. Conversely, resources available to some units may not be sufficient to achieve the desired output. One task of micro-planning is to coordinate these resources (labor, raw materials, or production tools) in a way that enables the desired outputs to be achieved. As we mentioned at the beginning of this chapter, since the interests of individual economic units in a capitalist system are different from each other, planning is not feasible for them. One economic unit may waste its resources while another unit needs them. Here we will discuss a model that optimally reallocates resources using a relatively simple algorithm introduced by Cockshott.[56]

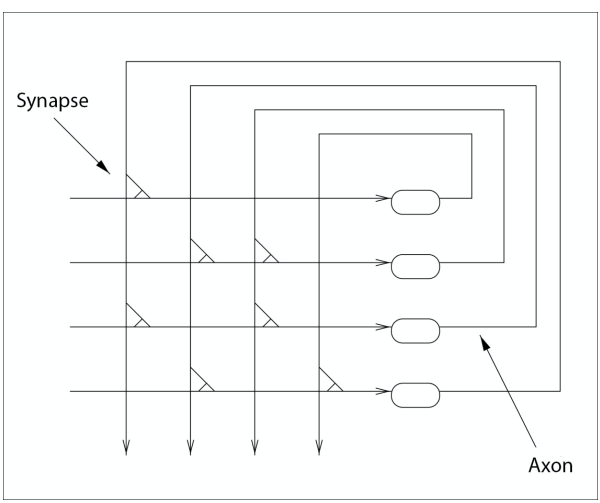
The Harmony Function

The harmony function is derived from the development of simulations related to artificial neural networks, which are a subset of artificial intelligence. Researchers in this field believe that neural

systems can be analyzed using thermodynamic concepts. A neural system consists of numerous organs connected to each other, and their interaction can be reduced to statistical mechanics at a certain level of abstraction. Thermodynamic concepts such as energy, entropy, and tranquility can be effectively employed in neural models. Each neuron, like an atom in the molecule of a solid body, is related to a subset of the whole and reacts to it. In both cases, we have a large population that reacts under stochastic laws and local interactions with each other. Thus, an appropriate measure of energy can be defined for a neural network to understand how closely its behavior resembles the desired behavior. It can be shown that if we use a computational temperature index to examine the behavior of the neural network, then by using a tempering process, the network can stabilize around the desired behavioral pattern.

Neural networks can be seen as an economy at a certain level of abstraction. In an economic system, industries are interconnected through local interactions. Here, synaptic connections or electrostatic forces can be compared to the existing relationship between suppliers and consumers.

Look at the above model, which is a simple modelling of neural network behavior. Information enters the system from the left (input), and synapses located at the intersection of two

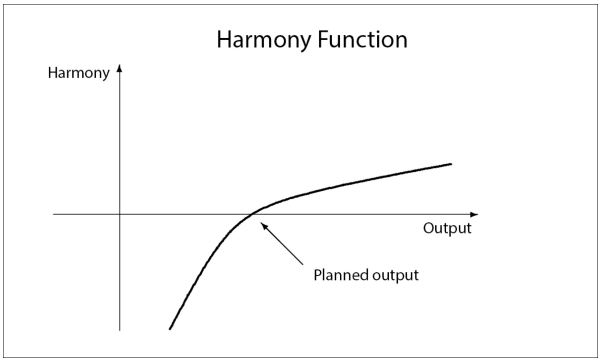


different neurons send information to one of those two neurons

(output). The allocation of each input a specific neuron depends on how much the synapse is stimulated. We can compare this to the columns of an input-output table representing the activity levels of a production unit. Here, we assign the label S_{ij} to each synapse, where i represents the rows of the input-output table and j represents the columns of this table. The stimulation power S_{ij} represents the output value of production unit i, which is required to produce one unit of output in unit j. In our model, the pattern of stimulation in synapses is synchronized with the volume of input data to the synapse. The level of stimulation resulting in cells represents the relative intensity that units must operate based on. This neural network can be mathematically modelled. Using such a model, we should be able to create some form of coordination for our economic system. Here, we need to see if we can introduce an energy indicator for the synapse that can be minimized.

People working with neural network models generally use this approach. Instead of finding an energy measure and minimizing it for the network, they try to maximize the harmony or balance of the network. This approach does not differ significantly from minimizing synaptic energy consumption, but it provides a simpler insight. If a neural network can provide the "right" response to external stimuli, we say that this network is balanced or is in harmony.

Here we attempt to apply this understanding of harmony to our economy. For this, we define a harmony function for each production unit like this figure:



As shown in the figure, it can be observed that as the net output of a production unit decreases (net output meaning the output of the unit after allocating production to other production units), harmony quickly decreases. If the output of a unit exceeds the required amount (the planned amount), harmony gradually increases. This can be interpreted simply as the problems caused by product shortages being much greater than the problems caused by excess production. We can write the following function for our desired properties:

Let $u = (\text{output} - \text{goal})/\text{goal}$.
If $u < 0$ then harmony $= -u^2$,
otherwise harmony $= \sqrt{u}$.

What this simple function tells us is that people's satisfaction with consuming each unit decreases as it exceeds one unit. If your uncle gives you a teapot for Christmas next year, you may be very happy, but if he gives you the same teapot every year for the next five years, your satisfaction with that uncle will diminish. But on the other hand, if there is no pot at all in your home, you will likely have a big problem. Therefore, the level of social satisfaction decreases rapidly as each unit of consumable output increases, and this can be well observed from the decreasing slope of the harmony graph as output increases.

If the output of a product equals the planned amount, the harmony is considered zero. As the output exceeds the planned amount, harmony becomes positive, and as it decreases, harmony becomes negative. This harmony function can be used to adjust the output of production units. Our goal is to create an algorithm based on which the harmony of the input-output table can reach its maximum without any of the units and consumers facing a shortage of goods. This algorithm can be planned as follows:

1. Allocate a random number for resources to each production unit. This is a random and hypothetical allocation done in the computer, and the actual allocation of goods in the economy does not take place at this stage. The reason for random allocation is that if our relaxation technique is valid, any point can be used to start

the algorithm.

2. Determine which of the available resources are limiting factors for each unit.

3. For each unit, remove the excess resources from its input, which are more than necessary for its own production, and add them to a hypothetical reservoir. This reservoir is common, and all units can add or remove their resources from it.

4. Calculate the harmony function for each unit.

5. Calculate the average harmony for the entire economy.

6. Arrange the units based on their harmony values.

7. Start from the top of the list (units with the highest harmony) and reduce their output until their harmony equals the average harmony. This is simple because harmony is reversible (i.e., you can go from output to corresponding harmony or from harmony to output). Add the freed resources to the resource reservoir at this stage.

8. Now find the units with the lowest harmony and allocate the necessary resources to them from the resource reservoir in such a way that their output increases and their harmony value reaches the average harmony.

9. Calculate the average harmony again. If this average differs significantly from the previous average, return to step 6.

This algorithm ultimately brings the level of the harmony of all production industries close to the harmony level of the entire economy. With several iterations, it can be observed that the average harmony undergoes a change of less than one percent. The problem here is that the final harmony of each unit will only be the maximum local harmony. At the end of the algorithm, it is observed that many unused resources remain, and the overall level of outputs is lower than the potential of the units. This is because the algorithm strongly tends toward reaching the harmony level with which it started its work.

One way to solve this problem is to add a deviation variable to increase output efficiency. In step 7, instead of reducing the output of industries with high harmony and bringing it to the average harmony, we reduce their output until it reaches a value of “average + B”. Here, B will be our deviation variable. Initially, we

set the value of this variable high and decrease it with each iteration. The result will be that initially only units with high initial harmony reduce their output, while units with low harmony continue to increase their output. As a result, the harmony average increases after each return, and the system stabilizes around the maximum harmony average.

If we select our dataset properly, the time required to execute this algorithm will be almost linear. That is, the time required to calculate the economic coordination, where there are 100 units, will be ten times longer than an economy with only 10 units. If we provide the dataset to the system not as an array but as a matrix, the execution speed of the algorithm will be nm, where n is the number of units and m is the average number of inputs for each unit. This algorithm, using modern computers, can calculate the harmony of a complete economic system within a few seconds.

This algorithm not only calculates the practical output target for each unit but also accurately allocates the raw resources and labor needed for each unit. This is a very efficient method for use in microplanning. With this pattern, we will be able to plan for economic units without using traditional measures such as traditional money and prices, and simulate this balance before the economy reaches equilibrium.

The Soviet and Chilean Experience

Effective planning for economic units depends on considering the complexity and interdependence of the inputs and outputs of these units; however, it is not limited to that. We have claimed that using new computational methods and algorithms such as the input-output calculation algorithm (and the harmony function) is a necessary condition for conducting socialist calculations. With this assumption, the question posed to us is how a command economy like the Soviet Union, where production goals were dictated from above by governmental authorities to production units, managed to survive for many years?

The Soviet focus on nationalized heavy industries and providing

plans for them in the 1930s, before the invention of modern computers, led the government to demand only a few limited outputs from these industries. Also, under the five-year plans introduced by the government, many instances of supply-demand mismatch were observed. However, the massive employment of labor as input into various industries allowed these industries to flourish despite these contradictions.

The planning committee of the Soviet government, given the complexities we mentioned, was unable to calculate the intermediate outputs with the total output of each economic unit at its disposal. Instead, planners started with goals that were gross themselves.

Another question is why, given that the computational method we introduced in previous chapters has been known since the 1930s, did the Soviets not use it for economic planning even in the 1980s? The crude methods the Soviets used for planning in the 1930s left a lasting mark on their economic system. In a system built on Stalinist rigidity (which diminished under Khrushchev but returned with Brezhnev's ascension), reform proposals for economic management were always viewed with suspicion. The method we used for calculation was reportedly considered by Soviet managers as a "bourgeois" method.

In the 1960s and 1970s, when the Soviet economy was in dire need of fundamental reforms, the Soviets used very basic computers in their planning agency, capable of performing calculations for only a few industries. These technologies were by no means sufficient for performing all economic calculations.[57] Moreover, even if the Soviets were to use the system introduced by us for calculation, manually extracting information from economic units, analyzing them, and presenting plans to units took so much time that the primary data became officially invalid and outdated by the time the planning stage was reached.

The computational model we referred to in this chapter requires a very large database with interconnected data. Such a thing was not available to the Soviets. The Soviet planners used a system called "material balances," in which resource inventories for production and intended uses for each product were recorded; somewhat similar to our input-output system. However, planners

were unable to effectively explain the existing relationship between these inventories.

There was also a political constraint that further contributed to the inefficiency of Soviet computations. Performing these calculations effectively depends on the free flow of information. Everyone must be able to input and output the current state of their business into a central system so that society as a whole can benefit from its advantages. This was practically impossible in the authoritarian Soviet system, where, due to political constraints, even the use of a photocopy machine was fraught with difficulties.

These are just a few reasons of the structural and coercive backwardness that the Soviets grappled with. However, the slow pace of receiving and presenting plans, which led to the presentation of ineffective plans, was not limited to the camp of “real-existing socialism." After the stock market crash in Britain in 1987, the British government presented a tax reduction plan in 1988 out of fear of recession. By the time this plan was implemented, the demand market had rebounded and was gaining momentum again, to the extent that in 1989 the government's plan itself led to inflationary effects.

Many of these issues are resolved if there is a plan that puts up-to-date information at the disposal of decision-makers and can immediately implement their decisions. This happened in Chile under the leadership of Allende from 1972 to 1973. During this period, Chile was able to use a system similar to the regulatory type we referred to in this chapter. While the Soviets were struggling with "enemies of the people," such a program was available to planners in poor Chile, which had been developed over the years with the available technology. This program used data provided by the country's major industries, which were transmitted via telecommunication technology to computers located in the capital. The government, using this technology, was able to obtain information from these major industries that didn’t age more than a day.

The outward appearance of this program is also not devoid of charm. The analyzed data of the program were displayed on large screens as diagrams. These diagrams, without showing any numbers to the viewer, indicated the level of capacity utilization of each

production unit and how the relationships between units flowed. This information was displayed in an operations room with seven chairs, each chair equipped with large buttons that allowed viewers to look at the data from different angles. Decisions were made before simulation was announced to observe their potential effects. One striking result of using this program was effective coordination of product transportation among various industries.

Before the Pinochet coup, it was planned to establish these operational rooms at the sites of key industries in the country. These operational rooms could sound alarms in the control room in case of any crisis or critical shortage of resources. If officials did not respond to system alerts in a timely manner, other operational rooms would come into play. This allowed each production unit to see an overview of its economic data without endangering other units and react effectively. It was also stipulated that the operational rooms in factories be managed by their own workers' committees.

With the Pinochet coup opening the way for Friedman's "free market" trial and error economics in Chile, this program and experiences of its kind were buried in the ruins of the Chilean presidential palace.

Consumer Price Regulation

Surpluses or shortages of consumer goods occur in every type of economy. A socialist economy must be able to introduce strategic measures to prevent overproduction. In this chapter, we have introduced an algorithm for precise planning of the output of production units to ensure resource efficiency. We have also explained that the price of products is actually the sum of the total direct and indirect costs incurred for producing each item. However, achieving equilibrium between production and supply does not always happen quickly, and sometimes temporary measures are needed to respond to demand fluctuations. The final price of goods must also be adjusted in a way that prevents both overproduction and shortages; however, since the inflation and deflation of prices can alter the real value of workers' wages,

consumer price regulation should be only a temporary and partial measure.

It should be noted that price regulation in our proposed model, detailed below, diverges significantly from price regulation in the market. Price changes in the stock market affect the overall market, meaning such actions often lead to changes in the total costs of goods dependent on that item. In our proposed model, companies and factories do not exchange finances with each other, so changes in consumer prices do not affect industries and businesses using that product as a raw material or intermediate product. Therefore, price regulation in our model will have much less noticeable consequences for industry and production compared to a competitive market.

Consider that producing an item requires 10 hours of work. This item is offered on the market for 10 tokens at Unicorn's marketplace. In the presence of excess demand, the final price of this item must be increased slightly to eliminate the excess demand and bring supply and demand into equilibrium. In this example, the price may be set at 12 tokens to eliminate the surplus. In this situation, the ratio of the actual price of the item to the total cost will be 12 to 10 or 1.2. This ratio must be determined for all goods and will vary for each item. The general rule is that the production of goods with a ratio above 1 should increase, and the production of goods with a ratio less than 1 should decrease.

If this ratio exceeds 1 for an item, two meanings are implied. First, consumers are willing to spend more than the actual value of the item to obtain it. Second, the work done on this item is more socially efficient compared to the average work of other workers. A ratio less than 1 exactly indicates the opposite to society. A ratio of 1 means that supply and demand equilibrium is established. To facilitate future calculations, a variable A is considered for the ratio of the final price to the labor content value.

Now we need to see under what conditions price regulation based on this ratio is desirable and what impact price regulation policy has on macroeconomic balances.

Consumer price regulation has a major objective: to prevent excessive surpluses or shortages of consumer goods. In general, increasing the price of a product reduces demand for it, and

decreasing the price encourages consumers to purchase more of that item. Since producers in Unicorn only enter initial costs, and the system determines consumer prices based on these initial costs and labor, a new algorithm can be used to regulate prices in each period by examining changes in supply and demand patterns. Unions can modify or issue instructions for this algorithm. Long-term mismatches between supply and demand for a product in the Unicorn signal that production of that item should increase or decrease in the next period.

In systems where income inequality exists, individuals with higher incomes have more choices than others, and poorer individuals are always disadvantaged in choosing items with higher costs. In our proposed system, the income base is fixed, and there is no income gap between workers. However, if society decides that the income base of workers should be different from each other (for any reason), other policies such as rationing and couponing for consumer goods can be used. Providing coupons to the poor can increase their purchasing power. This practice is currently used in many countries with capitalist economies (such as in the United States with food stamps for refugees). However, if subsidies are introduced for items that are insufficiently produced, stores will quickly run out of those products, and as soon as they are reintroduced, long queues will form outside the stores. With these explanations, the policy of providing subsidies will lose its justification if the income base is equal. Rationing of goods is only meaningful in emergencies, and in other conditions, planners should be able to increase the supply of high-demand goods. In a socialist system with an equal income base, price regulation is much more desirable than rationing and allocating subsidies to goods.

Let’s address the impact of price regulation on macroeconomic formulas. In Chapter 4 and Formula 4-10, we represented the tokens used for producing consumer goods as "consumption." Here, we define another component. We define "consumption tokens" as the tokens used for purchasing the produced goods and try in our macro planning to make the ratio of "consumption tokens" to "consumption" as close to 1 as possible. However, since the supply and demand are never perfectly balanced, the quantities of these two components are never equal, and the introduced ratio is always

slightly greater or slightly less than 1. For ease in future calculations, we designate the ratio of "consumption tokens" to "consumption" with the variable D. According to the formulas in Chapter 4, if net savings of individuals are less than the predicted amount, the "consumption tokens" will exceed the predetermined amount. In this case, planners may need to increase taxes or social work on products in the next period to increase overall savings. It is also possible that the decrease in savings is temporary, and in this case, intervention may not be necessary.

So, although our goal over time is to equalize the amount of tokens spent on production of a product with the tokens consumed for purchasing it, the value of the variable D is never one. The value of this variable sometimes exceeds 1 and sometimes is less than 1, fluctuating around 1 on average over various periods. This ratio reflects the aggregate price level and indicates, on average, how many tokens are spent to buy a product that costs one hour of work.

Now, with the two variables A and D introduced in this section, we see that the average value of variable A or the average price-to-labor-value ratio of the product tends towards D. With this consideration in macro relations, we write the equilibrium algorithm in Unicorn as follows:

1. Order consumer goods from producers with the condition that the total labor content of orders equals the amount determined for consumption in the current macro planning period.
2. Receive the orders and make them available to consumers.
3. Calculate the ratio D and "consumption tokens" separately for each item. Now, for each item, apply the following rule:
- If A is greater than D, increase the order for the item.
- If A equals D, continue with the order.
- If A is less than D, decrease the order for the item.

(To perform step 3, resources for producing items that require more orders increase, and resources for producing items that require fewer orders decrease.)

4. Return to step 1.

Note that in step 2, Unicorn must assign a price to goods, which may sometimes differ from the total labor cost. Determining this

price for consumers is challenging. Unicorn can use supply and demand charts (which capitalist economic units also use) for each item and employ complex trial-and-error algorithms. Local warehousing and storage capacity are also variables that can be used to reduce price fluctuations or control their magnitude.

In step 3, the goal is to produce enough amount of goods that will result in consumer prices equaling the total labor spent on the goods. This also requires a level of trial and error. This task may involve applying demand and indifference curves.

Ultimately, we predict that price fluctuations in our socialist system will be much lower than price fluctuations in a competitive market because, firstly, important factors such as profit and debt (related to factories and companies) are removed from the price determination cycle, and workers' income remains constant. While calculating the price of a commodity in a capitalist society involves various factors, in our model, it is mainly determined by the hours worked on the goods. Additionally, as mentioned earlier in this section, in capitalism, an increase in the cost of intermediate resources may lead to higher prices for products, whereas in our proposed system, industries do not engage in monetary or barter transactions with each other, and each company provides the necessary resources to other companies without monetary calculation.

Furthermore, in a capitalist system, the success of production units is based on the profits they earn at the end of each financial period, which is often directly related to further exploitation of the workers of that unit. The ratio of consumer price to labor content, which we discussed in this section, has no relationship with the level of exploitation of the workers.

Political Structure

So far, we have introduced a theoretical model of socialism based on current knowledge and the experience of previous models. We believe that such a system can only become a reality if all the economic structures based on the capitalist system have been dismantled earlier through the revolutionary force of workers and political movements aligned with them. This means that a socialist revolution must first take away the right of private ownership of the means of production from the capitalists and give it to the producers of value, abolish the wage system, and thereby change the mode of production from commodity production to socialist production. With a change in the mode of production, all social relations dependent on it also change. Political, legal, and consumption cultures continue in a new form, and the economic foundation and political structure will henceforth interact with each other in a novel way. The previous governmental structure, which not only managed the country but also continued to defend private ownership of the means of production and the entirety of the capitalist system as long as it gained profit for politicians or contracting trusts that provided public services, will disappear and be replaced by a system in which the people will take their destiny into their own hands instead of the rule of the minority over the majority.

In current political discourses, the use of the term "people" may only have meaning within populist frameworks. Considering that in a class-based society, each class has different economic and political desires and needs, equating all classes with each other is a task that only comes from populist politicians. But in a society where classes have disappeared, where no one has disproportionately more income than others, and "everyone" cooperates and lives alongside each other in a more or less egalitarian manner, "the people" will eventually find their singular meaning. By removing a state that is the "product of the irreconcilability of class antagonisms" and "an

instrument of the exploitation of the oppressed class"[58] and by fundamentally changing the parliamentary structures that reproduce the rule of the elite over the masses, a new form of state will be established that "organizes production anew on the basis of free and equal association of the producers [and] will put the whole state machinery where it will then belong–into the museum of antiquities, next to the spinning wheel and the bronze ax”[59]

In this chapter, our intention is not to introduce a complete blueprint for the executive, legislative, and judicial powers. The form of a socialist state directly depends on the alignment of revolutionary forces, the decisions of transitional governments, and the socio-economic relations existing in pre-socialist society. In this chapter, we only introduce features of a system that we believe theoretically align with the socialist mode of production presented in previous chapters and enable the participation of everyone in politics. Marx and Engels say, “…the first step in the revolution by the working class is to raise the proletariat to the position of ruling class to win the battle of democracy.”[60] For this to happen, it is required that our economic system can realize right after a socialist revolution, and that the revolution can effectively take the power from the ruling minority through militant organs and transfer it to revolutionary forces. In our view, this is the necessary condition for politicalization of the people and their intervention in all aspects of social life.

It is interesting here to see the evolutionary trend of Marx himself in political science (or political theory) itself. In the "Preface to A Contribution to the Critique of Political Economy," Marx refers to the wage system and criticizes Adam Smith, Proudhon, and others of his time for basing their political thinking on a misconception of "freedom" prevalent in the eighteenth century. A misconception of freedom in which "free competition" took precedence. Marx reminded that it is this political economic order that determines ideologies and policies, not our idealistic interpretation of the status quo.

Marx was very interested in the relationship between the state and capitalism. He expressed his critical views on the scholars of his time in 1845 and 1846 and thus showed the libertarian forces an "analytical and critical method" based on a materialist foundation

for decades and centuries to come.[61]

Therefore, Marx's approach is based on the freedom of people from private ownership of the means of production. This approach had a significant difference from the anarchist approach of that time. While the ultimate goal of anarchism and communism seems to be the same, many contemporary anarchists believe that if individuals and institutions change their mode of production on their own and work cooperatively without hierarchical structures, ultimately the entire society will move in this direction, and the world will ultimately be liberated from the grip of capital. For communists, this is more than just wishful thinking. No capitalist will willingly relinquish their ownership of the means of production and the exploitation of labor, and a society that seeks commonality will ultimately be forced to take revolutionary action and reclaim the means of production from the capitalists.

However, in this chapter, we will not discuss the conditions of transition, and as we mentioned, we assume that the means of production have become collective.

Nevertheless, a revolutionary party, in the classic sense, takes on two important tasks: effective intervention in the revolutionary process and, if necessary, intervention in politics and economic sphere after the revolution. These two tasks are distinct from each other in many ways. Understanding the mechanisms of intervention and organizing revolutionary forces before the revolution means engaging in a sphere where the dimensions are determined by bourgeois relations. However, once the revolution has taken place, the old mechanisms lose their effectiveness, and new relationships are formed, forcing the revolutionary party to change all its strategies and tactics in response to these major changes. The goal, means, and even the playground undergo radical changes once again. While a revolutionary party may be progressive and influential in the revolutionary process, it may lose its effectiveness in the new arena: a government governing socialist relations must be an institution that has the closest political relationship with the economic levers of society and can act as a bridge between these two spheres. Therefore, as can be inferred from revolutionary experiences such as the October Revolution, effective participation in the socialist revolution does not necessarily mean the ability to

have a desirable influence on the relations after the revolution.

As we mentioned, the use of the Unicorn system allows all members of society to systematically interact with other individuals and economic and political institutions of society. Production units and companies will be in contact with each other and with society through their own guild council or workers' council. How these organizational councils should be structured is not the subject of our discussion; these organizations can be general assemblies, hierarchical structures, or labor unions. The key here is their access and influence on the processes of Unicorn and their ability to make changes in it. Some economic units already have their own councils even before the creation of socialist conditions; otherwise, they must independently form a council that is the decision-making authority for that unit and its connection to Unicorn. The workers and employees, when forming their councils, write the relevant laws themselves, and there are basically no restrictions on them in this regard. The responsible of the council can be selected on a rotational basis or by voting from among colleagues. With special access to the profile of the economic unit's council, the responsible of the unit or council can provide input-output data to Unicorn, receive proposals from decision-making and local bodies, implement them in their unit, and communicate with other units. An economic unit without a council is deprived of access to Unicorn, and the workers employed in it cannot communicate with the treasury and other organs of society. The council is the smallest and most important unit in the political hierarchy of society. In our view, the responsibility for making the most important political decisions should be entrusted to these councils.

Workers engaged in their council receive remuneration based on the hours they spend working in this institution. Work in the council can be done according to the decision of the workers either in non-working hours or office hours. The council may hire individuals for outsourcing some tasks. The employment conditions of individuals outside the council to work in the council can be determined by the council itself or the union.

Related workers’ councils form their unions after deciding the dimensions of their desired organization. The union of workers' councils is an organization that is placed at the top of the political

hierarchy pyramid above the workers' councils. Unions are the most influential organizations in the macro-political sphere of society, and the government is formed by their assembly. The government directly intervenes in all decisions of society - including strategic planning and major political decisions. Any worker can, if willing, become a candidate to work in the council or the union relevant to their business and must have the opportunity to participate in political decisions that affect their personal and professional lives. The union is responsible for providing guidelines and economic and political algorithms to Unicorn and reviewing requests and proposals sent and sorted by Unicorn's secretariat. Unions and councils are constantly in touch with Unicorn and exchange information with it.

Unions can invite experts and specialists from various fields for short-term or long-term cooperation. Engineers, economists, lawyers, and other professionals (who are also members of their own councils and unions) can work full-time in unions and play a role in decision-making bodies.

Consumers also have their own council that individuals can voluntarily join. The purpose of forming such councils is to examine the quality of production processes and implementation of guidelines for Unicorn to improve supply processes while considering the interests of consumers.

In addition to workers' councils and unions, local councils must also be established for each province, state, city, village, and district. These councils will be engaged in local affairs and the administration of regional services. The overall structure of the political system of the land managed by the socialist economic system can vary and should be determined by a referendum organized by the governing council. Whether the administration is unified or federal ultimately does not make much difference in the overall shape of the economic system, and suitable formal and technical changes can be delegated to popular will in both forms through adjustments to Unicorn.

Government and Democracy

The political structure of no two countries in the world today is exactly alike, which shows us that the form of government is subject to the material conditions and social circumstances of each society. For this reason, a significant part of political theory that deals with the role and position of the government merely examines it from the perspective of its capitalist role.

In our view, the role of the socialist government should be as the representative of the sovereignty of the workers over political matters and the guardian of their interests, by eliminating classes and moving society towards communism to the greatest extent possible, and transforming it into the smallest executive organ of society to the point where "state interference in social relations becomes, in one domain after another, superfluous, and then dies out of itself; the government of persons is replaced by the administration of things, and by the conduct of processes of production."[62] The disappearance of the government according to Marx and Engels necessarily implies that people in a classless society are capable of overcoming all their problems with each other's assistance and reforming society. With this assumption, two general types of government can be imagined in the executive phase of socialism. One is councils' administration and the other is direct democracy. The goal, as Marx pointed out, is "converting the state from an organ superimposed upon society into one completely subordinate to it."[63]

In the council administration model, workers' councils choose their higher organs and these organs, in turn, select responsible officials at the top of the power hierarchy to eventually form a central council or supreme council which serves as the highest decision-making body in society, determining committees, ministers, and shaping various institutions to intervene in domestic and international political affairs. In this model, as mentioned, power is delegated from bottom to top. The smallest workers' councils can dismiss and appoint officials in higher councils and unions and shape their structure.

In the model of direct democracy, the masses elect the highest government organs and also the members of the legislative branch through voting, and voting boxes are the main mechanism of

delegating power to top officials. These officials will have the duty to advance the political affairs of society by selecting a competent cabinet and determining the limits of legislation. In this system, people-elected representatives and the formation of a parliament as the highest legislative body, the legislative power is delegated to this organ.

Each of these two systems may be efficient or imperfect for various reasons, so it is not the subject of our discussion which one is more suitable for a workers' government. Here we only confine ourselves to mentioning a few points about these structures.

Electing the highest officials of the country through general voting may suggest to the public that they have a decisive role in their destiny. However, with a brief look at history, we see that the decisions made by elected officials are sometimes against the will of the people and crude, serving the interests of cartels that include friends and associates of the elected ruling officials. Public participation in politics is fundamentally different in capitalism. If in bourgeois democracy people only express their involvement in the political process through voting once every few years, in socialism, due to changes in economic circumstances and the generalization of people's direct participation in the decisions about economy, politics becomes a public affair. Here, one or two votes every four years is no longer a symbol of people's involvement in politics, but individuals form people's organizations, councils, and foundations through which they can participate in the political process on a daily basis by forming alliances. Additionally, communism does not mean the end of economic and social contradictions in society. The principle of contradiction is perpetual, and as Mao said, nothing exists without contradiction[64], and according to Marx, all that is solid melts into air. Communism is a dynamic system in which thesis and antithesis influence each other at every moment to create a new phenomenon. Therefore, the opposition and critics should be able to shape their own antithesis without the need for permission from government officials because otherwise society will regress into stagnation. Hence, despite the attractive title "direct democracy," this concept does not necessarily imply maximum people's involvement in politics. The formation of councils beyond the ones defined by the law and desired people's

groups and clubs should be free, part of the foundation of a socialist society and should also be encouraged by executive and legislative authorities.

On the other hand, the consolidation of power by a strong central government, where the mechanisms for change are highly complex, can practically render the idea known in the Soviet government as "democratic centralism" ineffective. In Tsarist Russia, and even after the October Revolution and the formation of the Soviet government, soldiers and officers played a significant role in exerting extrajudicial power in various areas of society. The idea of democratizing central planning (democratic centralism) was something that the revolutionaries of the 20th century believed in (Lenin, before his death, warned about the formation of an elite bureaucratic class in "State and Revolution"), but due to the inability to create a powerful yet dynamic alternative that could eliminate the competitive market and socialize production, they were unable to implement it. The Soviet government could only nationalize the "mature" sectors of the Russian economy and determine their output from the top, while the majority of the Soviet economy was left to its own devices, with planning policies unable to exert influence on them. In any case, even if this had occurred, it would have meant that an elite group of economic theorists, without sufficient knowledge, would have dictated the output of all economic units.

In the early years after the October Revolution, the Soviet Union declared centralization to represent the will of the workers and then legally proceeded to suppress the workers' demands by integrating the trade unions into the state and separating them from the workers. One of the main demands of the unions in the 1920s, advocated by the Mensheviks and SRs, was an increase in the minimum wage. This issue was debated at the 11th Congress of the Communist Party of Russia:

> "... with the urgent necessity to increase labor productivity, to work lossless, and to achieve profitability of each enterprise ... inevitably leads to a certain contradiction of interests between the working masses and the directors, heads of state enter- prises or authorities to which these enterprises are subordinate in questions of working conditions in the

enterprise. Therefore, concerning socialized enterprises, trade unions have an unconditional duty to defend the interests of the workers…”[65]

With the retention of the market in the Russian economy, the state could only control it coercively. However, it seemed that, from the very beginning of the formation of the state, it was the market that had influence over the Soviet planning authority. In the meantime, the Soviet political system had to control the market on one hand and respond to the workers' needs on the other. This issue demanded two different types of policies, which even theoretically were beyond the capability of a single political party. This conflict of interest progressed to the point where the Trud newspaper in 1928 quoted the Central Council of Trade Unions, stating that the Supreme National Economic Council was "not guided by the interests of workers, but by the financial interests of industry.”[66]

China, which previously accused Russia of being counter-revolutionary, signed multiple peace treaties with the United States and Western Europe in the 1970s and then openly moved towards capitalism. Milton Friedman, the notorious neoliberal economist and one of the proponents of deregulation policies favoring the accumulation of financial capital, which eventually led to the crises of 1997, 2002, and finally 2008, stated in his final years that he was not only an economic advisor to the U.S. Republican Party and Pinochet, the dictator of Chile, but also an economic advisor to the bureaucrats of the Communist Party of China.[67]

In our view, solving the problem of socialist calculation is only possible in two ways: central calculation or delegating it to the market. Central calculation can lead to risks that are not unfamiliar. One such risk is the emergence of a new wage labor system under the guise of socialism, where workers continue to produce value under conditions where the central planning system has not resolved issues like the division of labor, wages, and alienation that existed in capitalism but has merely transformed them into another form. Workers in such conditions cannot make decisions about their destiny or their society. Hayek's criticism of a central authority deciding for the majority is valid because the minority will never have access to the tacit, informal, and extensive knowledge needed to manage an entire economy, while this knowledge exists among

the massive society of producers.

In the market, however, price and profit are the main drivers of the economy, not people's needs. Our intention here is not to dismiss market socialism as a stepping stone towards communism; we are simply discussing another model of a socialist economy under planning.

So if central planning can solve part of the socialist calculation problem and its main challenge is the lack of access to the knowledge that only the human factors of production possess, how can a centralized framework be democratized and decision-making entrusted to the workers?

In the Unicorn model, the center is a computer system that has access to all the economic relations of society and is also capable of generating patterns of consumption trends. While this program should theoretically be able to plan to meet the current needs of society, turning it into the sole decision-making entity regarding the output of economic units and political decisions presents us with the problems mentioned above. It can be said with certainty that turning a computer program into the manager of all economic and political needs of the people—if possible—conjures images reminiscent of the novel "1984." The abolition of wage labor relations is only possible if this central program is under the command of the producers and consumers and cannot make decisions contrary to their will. Thus, the center should only be able to offer proposals for planning. The review of these proposals will be the responsibility of the political structure that the workers have created. This structure can take various forms, and further discussion on its exact dimensions, especially today when socialist economy is not a present reality, seems somewhat non-dialectical and fanciful.

Foreign Trade

Every country needs to acquire products that cannot be produced domestically or whose production, given the conditions of labor productivity and international relations, is less cost-effective than importing them from other countries. If these products are essential for key industrial units or basic items such as raw materials, the issue of planning in the field of exports and imports becomes more significant and strategic.

Many communist thinkers, including Trotsky and Marx himself, believed that due to the conflict of interests between socialism and capitalism, if socialism were confined to a single country, it would eventually become isolated, lose the ability to counter the threats of global capitalism, and be doomed to fail.[68] The globalization of capitalist markets and political pressures against the governments of Cuba, China, and the Soviet Union have indeed confirmed this claim, and this awareness led the Soviets to lean towards global revolution and the creation of a socialist bloc in Europe. The politically challenging point here is that if a socialist state wants to trade with the global capitalist market, this trade must necessarily, at least in some areas, be conducted under the capitalist rules of the game, which conflicts with socialist values. The lack of commercial mechanisms with competitive markets would also lead to shortages of raw materials in the socialist territory, which could pose serious risks to the daily lives of socialists.

We believe that predicting the failure of the idea of socialism in one country has a logical basis, but it seems that given the existing national structures and global boundaries, the initial forms of socialism begin in one country and, with the application of political will, spread to other territories. This process cannot be without friction, but the impossibility of it, at least theoretically, is meaningless. In this chapter, we address the approaches that a socialist state can take in the initial phases regarding foreign trade and the provision of foreign exchange resources and raw materials. It is clear that our focus is to introduce an economic-political

model, and the political will of socialist planners plays a significant role in the success of this model.

Marxist theory in the field of foreign trade faces significant shortcomings. Much of Marx's work was built on Ricardo's theories, but Marx himself, who intended to dedicate part of "Capital" to the discussion of foreign trade, passed away before doing so, and most Marxist thinkers after him focused more on issues of politics and culture rather than economics. For this reason, many of the questions that a socialist state faces regarding foreign trade policies - especially due to the rapid advancement of financial markets and the globalization of competitive markets - remain unanswered. Most of the existing literature in this field belongs to market analyses and classical economics. One reason for this is the globalization of market economies and the lack of justification for Marxist analyses of the free market economy to create a socialist alternative.

The policies that each territory chooses for imports and exports depend on several factors. One of these factors is the abundance of raw materials such as oil and copper. Another is the relative income of workers in two countries compared to each other, and another factor is the productivity and efficiency of production units. All these factors together show what policies countries will pursue in the field of mutual trade. Here, we will address these factors from two perspectives: trade with capitalist countries and trade with other socialist countries. To examine trade with capitalist countries, we will have to provide an analysis of global competitive markets that allows us to expand the theory and trade with competitive markets. Here, we assume that the productivity of capital in capitalist countries differs from one another and that labor in our socialist system is at least partially less productive compared to capitalist countries. Therefore, it can be concluded that given the different productivity of labor and capital between countries, trade between the socialist state and at least several capitalist states will be beneficial for both parties.

As mentioned, the socialist state needs to obtain foreign currency from capitalist countries for various reasons, including acquiring raw materials and machinery through imports. Exporting, tourism, and borrowing from foreign governments or banks are several ways countries can obtain foreign currency. In our

envisioned socialist system, all these activities are controlled by unions rather than the private sector, making monitoring and control of the trade balance much more effective than in a capitalist system. With precise output information from the Unicorn system, the state can quickly restrict imports in the event of declining exports, thereby preventing crises. However, curbing imports, especially when key industries directly rely on imported goods, can have severe consequences. Even if the general policy prioritizes importing intermediate products needed for industry over consumer goods, cutting off imports of consumer goods negatively impacts consumers' living standards and is undesirable.

Reasons like these led some Eastern Bloc countries (including Poland and Hungary) in the late 1970s to become more inclined towards taking foreign loans. These countries subsequently had to impose increasing pressure on their working class in the form of reduced real wages due to rising interest rates on these loans and changing trade conditions to repay these loans. Austerity policies in Eastern Bloc countries resulted in these countries officially becoming pawns of major capitalist countries, diverting products that should have been provided to their consumers outside their borders.

Given this context, perhaps adopting Mao's policy of keeping the trade balance even and avoiding foreign loans as much as possible would be more desirable. By pursuing such a policy, exports and imports can be balanced, and instead of mandatory future exports to repay debts, these exports can be conducted more freely today.

The value system we introduce here uses a pseudo-currency that does not circulate in economic relations to prevent the formation of monetary capital. As such, it will be required—like the former Soviet Union—to conduct international payments in currencies such as dollars or yen. However, this is not the only possible alternative. The cost of imported products can be paid in an account of domestic tokens. The seller of items entering the socialist system can receive credit equivalent to their sale price in tokens. This seller will be able to convert these tokens into their destination currency in financial markets, similar to any other currency. In this scenario, the tokens are exchanged among foreign capitalists but do not circulate within the socialist borders and do not enter these borders

in any other form. For this, the capitalist seller receives an account of labor tokens upon selling the product, which can only be transferred outside the socialist borders, and the transfer of foreign currencies by capitalists and individuals into the country is also prohibited.

Capitalists today engage in buying and selling various currencies and generally do not object to receiving a new country's currency; what matters to them is being able to cash these tokens in financial markets. The demand for these tokens mainly comes from foreign companies and tourists wanting financial transactions with the socialist state. There is no need for the socialist state to set an exchange rate; this matter is handled by capitalist financial markets. Additionally, the financial accounts of these capitalists will be maintained with the Ministry of Trade (and the Unicorn system), and they can use these tokens to purchase goods provided by the Unicorn system if needed.

The officials at the planning agency can make decisions regarding the import or export of items based on the exchange rate provided by financial markets and the rate demanded by foreign companies. The main guideline here is that if the equivalent labor hours spent on producing a domestic good exceed the equivalent labor hours for a similar foreign product, the decision can be made to import the similar foreign product. Conversely, if the domestically produced item is produced cheaper than the foreign equivalent, it can be exported.

Price fluctuations of foreign products and international conditions—especially if key sectors of the economy depend on imported items—are critical vulnerabilities in trade. Developing long-term plans can mitigate the negative impact of price fluctuations.

Black Market and Tourism

To avoid the Big Brother scenario of the novel “1984", it must be acknowledged that some individuals and businesses may create a parallel market based on capitalist money to accumulate monetary capital. Shopkeepers, despite all controls, may sell some of their

products to tourists from other countries for foreign currency. This money might be used to buy foreign goods that the state is unwilling to import for various reasons, such as drugs or other illegal products. Although small amounts of foreign currency do not pose a significant problem for the economy, the risk of forming large underground illegal enterprises is a constant threat to socialists. Therefore, any entry of capitalist currency into socialist borders should be prohibited. Tourists can purchase the tokens they need by converting their currency to tokens before entering the border. They can also use credit cards from their home country to shop at socialist businesses, thanks to pre-existing banking agreements between socialist and capitalist banks.

Citizens traveling outside socialist borders can obtain the necessary currency from banks or simply use the same plastic card they use within the borders for their payments abroad. In this scenario, the foreign bank would provide the required credit (electronically) at the time of payment in, for example, dollars. The bank would then open an account with the Unicorn system, allowing it to purchase socialist export products (in the future) equivalent to the paid credit amount. To prevent foreign currencies from circulating within socialist borders, the currency purchased by the traveler cannot be returned to the country. While tokens can be converted to currency, converting currency to tokens for domestic use is not allowed.

The Commune

With the elimination of private ownership of the means of production, human relationships undergo changes aimed at the eradication of the representations of this form of ownership. Private ownership of the means of production is just one type of ownership, and by changing it to public ownership, the broader category of ownership does not disappear entirely but is altered to eliminate its economic manifestations. Due to the dominance of the idea that the means of production are social, the ax you have made not only helps you but also assists all your neighbors who need it, thus creating value. Everyone gains the maximum possible share of social production; no one is significantly wealthier than another, and there is no fear of "losing" anything. The numbers of robbery and selling one's body on the black market decline, and people feel more secure together because greed does not exist. These ideals could only emerge with the abolition of private ownership, and since private ownership is just one specific form of ownership, the possibility of its abolition and transformation into a public affair is greater. The minority must step aside for the majority, a minority that has governed human daily behavior in a way that protects its interests for hundreds of years. We cannot say precisely how all social relations will change in socialism and communism, but we can speculate on the directions in which these changes will occur. Additionally, we can guess what mechanisms a socialist council state might have to support these changes.

With the socialization of the means of production and the prioritization of workers' decisions regarding the relations in their workplaces, foundations will be established where workers are no longer atomized and alienated from each other and feel greater solidarity with their colleagues and neighbors. People will decide to share various aspects of their lives with each other and live together in communal spaces without greed, envy, or expectation. This is likely to be part of the new communist relations. Such spaces

already exist today in European societies with a history of communism and anarchism spanning several centuries. For instance, the residents of Marinaleda, a town in the province of Seville, Spain, with over 2,500 inhabitants, have been living communally since at least 1978.[69] There is full employment there, and considering the main agricultural productions are carried out cooperatively, there is a high growth rate. If individualism is the main feature of modernism and capitalism, communal coexistence is a prominent feature of life in the socialist and communist mode of production.

Communes are large spaces that house dozens or hundreds of citizens and have a historical presence from Europe to the Far East. Although in models like the Russian ones, living in these communes was limited to cramped and low-quality spaces, allocating funds to construct large and modern units where each individual has a room and sufficient living space can overcome many limitations of individual living.[70] Many architectural and engineering plans exist in this field that a socialist government can pilot and implement after validation.[71]

Communes can simplify access to certain services for citizens and smooth out problems. Services such as restaurants, kindergartens, various educational classes, technical workshops, recreational facilities, and elderly care can be provided in buildings where citizens live together. These communes have their internal economy but can also contribute to the socialist economy outside the commune. Cooperative farms utilizing modern agricultural methods are not new and are the main source of production and distribution of agricultural and livestock products in some regions of Western Europe. However, the formation of other types of economic communes can be anticipated.

Cockshott and Cottrell have examined the details of the economy of these communes and their connection to the mother economy, showing that these units can operate somewhat independently of the main economy, and their interaction with the main economy can be explained with a kind of token exchange rate.[72]

In designing communes, facilities such as swimming pools, playgrounds, gyms, gardens, medical centers, and many other amenities can be included. Some of these services are provided by

the commune members themselves, while others are outsourced, creating employment. Living in a commune saves space, resources, and energy.

1 For instance, look at the text published by Sperling group based in Germany on inflation, the content of which is briefly explained here. https://bit.ly/45bo0ou

2 Sahra Wagenknecht explains about this more on her Youtube channel. One related video is titled “Bankenheben - Droht eine Finanzkrise?”

3 Wallerstein, Immanuel. 1979. The Capitalist World-Economy. Cambridge University Press

4 Eaton, John. 1949. Political Economy, A Marxist Textbook. Lawrence and Wishart. p-179-182

5 Initiative demokratische Arbeitszeitrechnung

6 You can read the critique on the website of IdA here: bit.ly/3LBqRA6

7 It should be noted that many contemporary thinkers, especially scholars of the so-called "New Left" traditions, have attempted to expand this understanding of classes in recent decades (particularly in the 1960s), especially in the realm of social sciences. For instance, Ervand Abrahamian, in his book "Iran Between Two Revolutions," attempts to show that classifying classes as either workers or capitalists, or using the "economic class" metric as we have discussed here, is insufficient for explaining certain phenomena, including the 1979 Revolution in Iran. In his book, he tries to demonstrate that "the clergy" were a class that played a significant role in Iran's political sphere from the Constitutional Revolution to the contemporary era. It is necessary to mention here that in Marxism, class has a purely economic meaning and is based on the ownership or non-ownership of the means of production. In contrast, proponents of the "social class" definition (or "class" in Abrahamian's book) argue against conventional Marxist class analyses, claiming that “man’s social being - at least in the Third World - is determined by his

consciousness” and thus “have reversed Marx.” In our view, this is the same old struggle between materialism and idealism. (Quotes from Abrahamian) For more:

-Abrahamian, Ervand. 1982. Iran Between Two Revolutions. Princeton University Press

-Pye, Lucian. 1966. Aspects of Political Development. Boston

-Almond, G. & Verba, S. 1965. The Civic Culture

8 Fetscher, Iring. 1967. “The Young and the Old Marx.” *Marx and the Western World*

9 Marx, Karl. 1867. “The So-called Primary Accumulation”. Capital Vol I

10 Underestimating the literature produced by Marx, Noam Chomsky notes, “There’s nothing about socialism in Marx, he wasn’t a socialist philosopher —there are about five sentences in Marx’s whole work that refer to socialism.”
- Chomsky, Noam. 2002. Understanding Power, The Indispensable Chomsky. The New Press

11 Marx, Karl. 1867. Das Kapital. Chapter 1

12 Lenin, V. I. 1917. The State and Revolution

13 Marx, Karl. 1847. Wage Labor and Capital

14 Marx, Karl. 1852. The Eighteenth Brumaire of Louis Bonaparte

15 Note that in economic literature, the concept of "market" has a different meaning than the place of trading. In its simplest definition, a market is described as a system where the price of goods creates the motivation for consumers to consume and for producers to produce. In market-based

economic perspectives, the price of goods or services conveys all the information about the goods, and the elimination of price leads to the elimination of the market. However, there is considerable debate among economists about this very definition, and proponents of capitalism believe that the market is the only mechanism or the best mechanism available for solving the economic problem in all societies.

16 Lange, Oskar & Taylor, Fred M. 1938. On the Economic Theory of Socialism

17 Marx, Karl. 1891. Critique of the Gotha Program. Part I

18 Hayek, F. A. 1948. Individualism and Economic Order

19 Hayek, F. A. 1956, "The Present State of the Debate." *Collectivist Economic Planning*

20 Lachmann, Ludwig M. 1976. "On the Central Concept of Austrian Economics: Market Process." *The Foundations of Modern Austrian* Economics

21 For instance, see Roemer, John E. 1996. "A Future for Socialism" *Equal Shares - Making Market Socialism Work.* Verso

22 Engels, Friedrich. 1880. Socialism: Utopian and Scientific

23 Von Mises, Ludwig. 1990. Economic Calculation in the Socialist Commonwealth

24 Albert, Michael. 2008. "Venezuela's Path" *Real Utopia: Participatory Society for the 21st Century*

[25] Saros, Daniel E. 2014. Information Technology and Socialist Construction. Routledge

[26] Cockshott, W. Paul & Cottrell, Allin. 1993. Towards a New Socialism

[27] Source: US Federal Reserve, 2022.01.01 - Note that the above figures may be reported differently in various sources. All our calculations have been based on the official information published by the US government. The differences between various reports do not significantly affect the resulting outcome.

[28] We have tried to exercise caution in our calculations. The amount of $26 was obtained based on the assumption that all employed individuals are working full-time. However, many employees have part-time jobs. It is also important to note that these calculations have been overly simplified. Productive and non-productive activities should be distinguished from each other. Items related to intermediate consumption (items used in the production process to produce goods) and some other items included in the national accounts we used here should be factored out. Therefore, government management costs and financial intermediation related to property taxes and interest payments by companies should be subtracted from the total production. These monetary amounts do not represent actual consumption in the production process; they are merely expenses that the industrial sector must pay from its profits. Hence, wages paid to workers in the financial intermediation sector should be excluded from these accounts, but we did not consider these factors here for the sake of simplicity. Additionally, to maintain consistency in these calculations, the number of employees in these sectors should also be subtracted from the total number of employed individuals for whom the per capita production was calculated.

[29] There are critiques of the labor theory of value, which is the joint work of Adam Smith, David Ricardo, and Karl Marx, that attempt to question significant aspects of this theory. The basis of this theory is that the value

or price of a commodity in capitalism is related or proportional to the labor content performed on the commodity. However, according to critics, the labor theory of value does not provide evidence for this claim, and we only encounter an insufficient numerical analysis of this claim in the book "Capital." Most critiques are based on the idea that the equality of price with the labor content of a commodity exists only under specific conditions, and it cannot be said that the price of a commodity is exactly proportional to the content of the labor performed on it. Changes in production technologies, profit, supply and demand, and other factors all affect the final price of the commodity, and these effects sometimes lead to a discrepancy between the price of the commodity and its labor content value. Discussing these critiques is beyond the scope of this book; however, if we accept that these criticisms of Marx's and others' analysis of the market system are valid, this does not undermine our work because, in the system we introduce, determining factors such as surplus value and profit are eliminated, and the resources needed to obtain the means of production are directly given to producers. Moreover, as critics say, the value that these means transfer to the final commodity is "exactly" equal to their labor content in the framework of budget and macroeconomic calculations, and the wages of workers are calculated based on their working hours and remain stable. Therefore, these arguments lose their validity in the socialist system we envision: price in our system is not a posterior issue requiring theorization; rather, it is entirely proportional to the labor spent on it.

30 Marx, Karl. 1867. Capital. Vol I

31 Robert Owen, English socialist (1771 - 1858)

32 Marx, Karl. 1867. Capital

33 Varga, R. S. 1962. Iterative Methods for Solving Matrix Equations. Case Institute of Technology

34 The time required to compute the Jacobian sequence we are interested

in depends on the number of outputs and the sequences needed for approximation. If, for instance, we have ten million products, each requiring 200 direct inputs, and we need 100 iterations to compute them, we need 2 * 10^{11} computations. A home computer can perform this calculation within a few minutes under suitable conditions.

[35] Statistical Center of Iran. 2012. “Simple Input-Output Table Framework”

[36] Saros, Daniel E. 2014. Information Technology and Socialist Construction. Routledge

[37] Of course, it is somewhat optimistic to think that monetary relations based on capital accumulation in the system outlined here will never reemerge. For example, in Russia, some sellers (especially sellers of antique products who mostly dealt with foreign tourists) were able to create a parallel monetary system and thereby exchange their goods for foreign currencies. Interestingly, the Soviet government did not prevent these businesses from operating because of its need for foreign currency.

[38] Hayek, F. 1945. “The Uses of Knowledge in Society” *Individualism and Economic Order*

[39] Ostrom, Elinor. 1990. Governing the Commons

[40] Adaman, Fikret & Devine, Pat. 1997. “On the Economic Theory of Socialism”. *New Left Review 221 January–February 1997*

[41] “In spite of this advance, this equal right is still constantly stigmatized by a bourgeois limitation. The right of the producers is *proportional* to the labor they supply; the equality consists in the fact that measurement is made with an *equal standard*, labor.”
Marx, Karl. 1875. Critique of the Gotha Program

42 Marx, Karl. 1867. Capital

43 Marx, Karl. 1867. Capital

44 We have simplified the discussion up to this point, but we believe that we should not and cannot go into more detail. It is clear that many factors are involved in pricing, including transportation, distribution, and taxes applied to certain products such as alcohol, cigarettes, and minerals. All these are matters for discussion and policy-making by unions and councils, which we will address in the following chapters on how they are organized.

45 Keynes, John Maynard. 1936. The General Theory of Employment, Interest and Money. Chapter 16

46 Süddeutsche Zeitung, 22 September 2013

47 Roemer, John E. 1996. Equal Shares (Making Market Socialism Work). Verso

48 "How a 'typo' nearly derailed the Paris climate deal", The Guardian, 16 December 2015

49 Lavoie, Don. 1985. National Economic Planning: What is Left?

50 Cockshott, W. Paul & Cottrell, Allin. 1993. Towards a New Socialism

51 Orazem, Frank. 1989. "Agriculture Under Socialism" *Slovene Studies*

52 Daum, Timo. 24.11.2022. “A Planned Economy and a Culture of Experimentation” *Rosa Luxemburg-Stiftung*

53 Dobb, M. 1935. “Economic Theory and Socialist Economy: A Reply” *Review of Economic Studies*

54 Dobb, M. 1933. “Economic Theory and the Problems of a Socialist Economy” *The Economic Journal*

55 Hahnel, Robin & Albert, Michael. 1991. The Political Economy of Participatory Economics. Princeton

56 Cockshott, Paul. 1990. The Harmony Algorithm

57 Cave, Martin. 1980. Computers and Economic Planning: The Soviet Experience

58 Lenin, V. I. 1917. The State and Revolution

59 Engels, Friedrich. 1884. The Origin of the Family, Private Property and the State

60 Marx, Karl & Engels, Friedrich. 1848. The Communist Manifesto

61 From the syllable book published for the students of Political Science at the University of Tripura

62 Engels, Friedrich. 1877. Anti-Duhring

63 Marx, Karl. 1891. Critique of the Gotha Program

64 Mao, Tse-tung. 1937. On Contradiction

65 “The role and tasks of trade unions under the conditions of the New Economic Policy”. Resolution of the XI Party Congress CPR. March-April 1922

66 Trud, No. 31, 1928

67 Zenderoudi, A. R. 2012. “Socialist Alternatives to Capitalism” *Tribune Zamaneh*

68 You can find more about Trotsky’s idea of Socialism in one country in these sources:

-"The Permanent Revolution" (1930)

-"Results and Prospects" (1906)

-"The Third International After Lenin" (1928)

69 Statistics from 2011. Source: Wikipedia

70 In economic literature, MES or Minimum Economic Size refers to the smallest size at which all activities of an economic unit can be accommodated. By extending this concept to communes, one can determine the minimum space required for each individual in relation to the commune. This has been historically done in many countries, including Germany, to establish a desirable standard of living for individuals in residential homes.

71 For example, refer to the following book, which is based on a study of communal units in Finland (Bofoellesskaber):
McCamant, Kathryn & Durrett, Charles & Hertzman, Ellen. 1989.

72 Cockshott, Paul & Cottrell, Allin. 1993. Towards a New Socialism